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Modeling ASEAN Global Linkages

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Prepared for
Asian Development Bank

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Acronyms

ADF	Augmented Dickey-Fuller (test)
ASEAN	Association of Southeast Asian countries
DF	Dickey-Fuller (test)
ECM	Equilibrium correction mechanism
EU	European Union
FDI	Foreign direct investment
GDP	Gross domestic product
GNP	Gross national product
MUV	Manufactured unit value (index)
PRC	Peoples Republic of China
QR	Quantitative restriction
REER	Real effective exchange rate
SITC	Standard International Trade Classification

Executive Summary

This study examines the global linkages of selected ASEAN countries composed of Indonesia, Malaysia, Philippines, Singapore and Thailand (hereafter ASEAN-5). While economic growth of each country undoubtedly hinges on domestic developments, it also depends on foreign trade and capital movements in the form of direct and portfolio investments. These external influences are largely driven by global developments, particularly in Japan, other Northeast Asian countries, the United States, the European Union, and within the ASEAN region. While the systematic determinants of the ASEAN-5 countries' linkages to these regions are relatively stable and robust, our focus is on the short-term dynamics underlying the transmission of income, price and other changes from the global economy.

ASEAN-5 Growth and the Global Context

For purposes of framing the analysis, we examine three widely recognized explanations of economic growth in Southeast Asia. The first focuses on supply growth in the region to explain the 'Asian Miracle' associated with capital accumulation, the absorption or assimilation of increasingly modern technology and the change in industrial structures. A closely related but more recent explanation is the fundamentalist view that structural factors have explained, first, the long-term growth of the Southeast Asian economies until mid-1997 and, second, the crisis in late 1997 and 1998. During the stellar years of the 'miracle' economies the dominant factors producing an outward-oriented, export-led growth were high domestic savings, human capital development, sound macro management and limited price distortions combined with careful policy interventions. During the 1997-98 crisis structural factors also dominated events, but this time in the form of weak financial systems that were undermined by large capital flows and exchange rate misalignments associated with the widespread use of relatively fixed exchange rate regimes. An alternative interpretation is that cyclical variations in the real dollar-yen rate created the misalignment and effected large changes in the pattern of trade and direct and portfolio investments throughout the Southeast Asian countries.

The third explanation of economic growth in Southeast Asia focuses on the rapid assimilation of the region in the global economy. While recognizing that industrial growth and transformation have been the driving force behind the economic growth of Southeast Asia, the handmaiden of that expansion has been the large growth of international trade and direct and portfolio investments generated by the rapid expansion of global production and markets. For the ASEAN-5 countries these systemic changes in the world economy have generated large volumes of international capital flows and transactions in goods and services, and brought about a widespread diffusion of production, transportation, and communication technologies from corporate contracting arrangements. This new globalization process emphasizes demand-led growth and the policy environment as a critical determinant of that growth. Over the long run, the

growing openness of the Southeast Asian economies until 1996 deepened the close link between economic growth and the rapidly changing global economy, but more recently they have made the ASEAN-5 economies susceptible to especially large changes in the trade and cross-border production activities.

The focus of this study is on demand-led growth in the ASEAN-5 economies in the context of the global economy. In examining linkages between the ASEAN-5 and the global economy, our focus is on the short-term or year-to-year impact of the global economy through real effective exchange rates, trade balances, international capital flows and changes in the structure of production, trade and investment in the ASEAN-5 economies. Notwithstanding the pervasive influence of the 1997-98 crisis on short-term movements in the near term, today's global linkages are rooted in behavioral relationships that have developed since the 1970s and 1980s. Our interest is therefore to identify and quantitatively represent the essential features that underlie the international transmission of income, prices and other factors, as distinct from an attempt to describe the complete ASEAN system of economic growth. As such, the set of causal relationships is parsimonious and does not explicitly consider the determinants of either supply growth or structural factors.

Modeling International Income Transmissions

Our estimates of the international transmission of income and other changes on the ASEAN-5 countries separate the long-run or equilibrium relationships between domestic income and foreign income, prices and other variables from the short-run or dynamic disequilibrium components of those relationships. We examine global linkages of the ASEAN-5 using an Equilibrium Correction Mechanism (ECM) specification that provides the means by which the short-run observed behavior of variables is associated with their long-run equilibrium growth paths. The ECM adjusts for any disequilibrium between variables that are cointegrated. As a result, it provides the means by which the short-run observed behavior of variables is associated with their long-run equilibrium growth paths. A closely related specification known as the "error-correcting mechanism" (also having the acronym ECM) models both the short and long-run relationships between variables.

Using the ECM we initially derive estimates of the international transmission of income changes on the ASEAN-5 economies and then extend that relationship to include exchange rates, international prices, interest rates, investment risks and other international influences on these countries. Our estimates of the foreign income elasticities of the ASEAN-5 countries are consistent with expectations. The short-term foreign income elasticities have a mean average of 0.4, and they range from near 0 for the relationship between Singapore and the United States to 0.9 for that between Thailand and Japan. The long-term foreign income elasticities have a mean average of 2, and they range from 0.6 for the relationship between the Philippines and Japan to over 3 for Singapore with that of the European Union. Estimates of the international transmission of income changes based on aggregate data from all the regions show a similar pattern as

those for individual regional estimates. These aggregated relationships are therefore used to estimate the international transmission of exchange rates and other influences on the ASEAN-5 countries.

Exchange Rates and Other International Transmissions

In addition to foreign income effects, we examine the effects of the following variables on ASEAN-5 economic activity: (a) *exchange rates* in the form of either the overall real effective exchange rate of the ASEAN-5 countries, bilateral real effective exchange rates with the major global regions, or the real yen/dollar exchange rate; (b) *international prices* in the form of either the terms of trade of the ASEAN-5 or world market prices for primary commodities relative to those of manufactures; (c) *interest rates* in the form of interest rate differentials either between those in Japan and those in the United States, those for ASEAN-5 lending and those for Japanese borrowing, or those for ASEAN-5 lending and those for borrowing in the Eurodollar market; (d) *investment risks* on portfolio and direct investments in the form of either real exchange rate fluctuations or more generally imbalances in the balance of payments that reflect the risk of real exchange rate changes and/or capital controls; (e) *world trade and capital inflows* in the form of world trade volumes, current account balances, the ratio of exports to GDP, and the importance of portfolio and direct investments to the economy; and (f) *intra-ASEAN linkages* in the form of the bilateral real effective exchange rate (REER) with other ASEAN-5 countries, the aggregate current account deficit of the ASEAN-5, and the region's reserve losses. In all cases, empirical measurement has been based on individual ASEAN-5 country estimates.

Exchange Rate Effects - The motivation for including real effective exchange rates in the relationship for the global linkages of the ASEAN-5 countries is well developed. During the period of rapid economic expansion in the 1980 and until 1996 a high premium was placed on keeping stable exchange rates and moderate to low inflation. In the subsequent crisis years, the exchange rate misalignments that emerged in the mid-1980s are believed to have created the framework for the worsening of domestic economic fundamentals a decade later. In analyzing these effects, past research has usually relied on measures of REER changes of the Southeast Asian economies with all their partner countries. In addition to this measure, we also test the bilateral real effective exchange rates of each ASEAN-5 country with the major global region of Japan, other Northeast Asian countries, the United States, the European Union and other ASEAN-5 countries.

We also examine the alternative hypothesis that the dollar-pegged Southeast Asian economies have been mainly influenced by yen-dollar exchange rate movements. Earlier works have shown that aggregate output of these countries has been closely linked to movements in the yen/dollar exchange rate. Those results have shown output in the Asian economies to be positively related to the yen/dollar exchange rate: when the yen weakened, output growth in the dollar-pegged Asian economies slows; when the yen strengthened, output growth accelerates.

We find real yen/dollar exchange rate movements to be significant in explaining real GDP changes in the ASEAN-5 countries. On average, the short-term elasticity of income with respect to the real yen/dollar exchange rate is equal to 0.05, while the average long-term elasticity is 0.8. All the coefficients had the expected positive sign suggesting that output in the ASEAN-5 economies is positively related to the yen/dollar exchange rate. The explanation for these findings is that when the yen has risen against the dollar, the export competitiveness of the dollar-pegged Asian economies has improved in the Japanese market and production costs have become more attractive to Japanese investors. Alternatively, when the yen has weakened (for example, as it did between mid-1995 and mid-1997) Japanese export demand and FDI outflows have contracted and economic growth in the Southeast Asian economies has fallen.

The REERs of the ASEAN-5 countries are statistically significant in explaining income changes of Indonesia, Malaysia and the Philippines. However, only in the case of Malaysia is the REER significant in the long run. These findings are not surprising since reduced form estimates that relate real GDP of countries to their REER are often unable to capture the transmission effects of this variable through the demand for exports and imports and direct and portfolio investments. Instead it is usually necessary to estimate structural equations relating each of the national income components (for example, export demand) to the REER and then estimating the individual effects on aggregate income.

International Price and Trade Volume Effects - In addition to real exchange rate changes, movements in world market prices for traded commodities and manufactures have impacted on the foreign demand for ASEAN-5 exports and domestic demand for imports. Moreover, international prices have had an indirect effect on ASEAN-5 growth through their impact on export-oriented FDI activities. We initially attempt to use two alternative measures of relative prices: the terms of trade of each economy, and world market prices for primary commodities relative to those of manufactures. Data for the terms of trade of most ASEAN-5 countries, however, are not available for the more recent years and these series were therefore not included in the final estimates. The alternative series on world commodity prices is more readily available. To approximate a terms of trade measure for individual countries, we derive a global terms of trade estimate based on the ratio of the index of commodity prices to that of prices for manufactures.

As expected, world trade volumes and world commodity market prices relative to those of manufactures are found to be significant in explaining changes in the ASEAN-5 countries' real GDP. The average of the estimated world trade volume elasticities equals only 0.02 in the short run but increases to 1.2 in the long run. This pattern is consistent among the ASEAN-5 countries: the short-term elasticity is low for all countries but the magnitude of all elasticities increases significantly in the long run, which suggests that adjustments take time but have an important influence on GDP. In the case of the global terms of trade, the average elasticity is generally higher in the short-run than that of world trade. These findings indicate that price transmissions occur more quickly than trade

volume effects, but that movements in trade volumes tend to have a relatively larger impact on ASEAN-5 GDP than do price variations.

Differential Interest Rate Effects - Interest rate differentials tend to affect movements in equity and debt securities on capital markets more than they do FDI movements, and therefore are likely to have a large influence on portfolio investments in the ASEAN-5. In addition, it is generally acknowledged that interest rate differentials resulting from the long-term upward movement in the nominal dollar value of the yen drove nominal interest rates on yen-denominated assets below those prevailing on dollar-denominated assets. That change led banks in East Asia to undertake foreign currency indebtedness by accepting cheap yen deposits without covering their foreign exchange risk.

To measure the effect that these interest rate disparities have had on the ASEAN-5 economies, we use the ratio of the nominal lending rates in each ASEAN-5 country to both the Japanese yen LIBOR three-month rate and US dollar LIBOR rate. However, the results do not support the use of this variable in explaining economic activity, except in the case of the Philippines, where the ratio of the Japanese yen LIBOR three-month rate to the US dollar LIBOR rate is statistically significant in explaining changes in real GDP. The reason for the general lack of significance of this variable in other countries may be the relatively short time period over which it influenced the Southeast Asian economies, compared with the fairly long time series (beginning in 1970) used for the equation estimates.

Investment Risk Effects - The main sources of risk for investors are interest rates, stock market returns, and contagion effects. Changes in interest rates can have large consequences on the macroeconomic performance and creditworthiness of developing countries, and more so through changes in portfolio investments than FDI. If investments in emerging markets are used only to increase portfolio returns when investments in industrial countries are under-performing, then the investments will be very sensitive to changes in industrial countries' interest rates. In the case of the Asian financial crisis, however, it was the lack of confidence in the asset market that led to panic liquidation in all the Southeast Asian stock markets. The liquidation, in turn, instigated large movements of funds offshore that reversed capital flows and drained official reserves. The resulting downward pressure on exchange rates was essentially domestically induced, although there were spillovers that gave rise to contagion and the pervasiveness of the Asian financial crisis. To test the effect of investment risk, we measure the risk premium on foreign loans made by financial intermediaries in the ASEAN-5 countries using the uncovered interest parity relationship. Using this measure we find the effect of risk premium on economic growth of the ASEAN-5 countries to generally be statistically significant. The average risk premium elasticity is -0.04 in the short run and it rises to -0.23 in the long run.

Balance of Payments Effects - A widely-used approach to identifying external sector effects on economies is the use of balance of payments and other indicators in place of price-related variables in the form of exchange rates, international prices and interest rates. To test the usefulness of this approach we adopt the indicators used by Little,

Cooper, Corden and Rajapatirana (1993) to the ASEAN-5 economies with some minor adaptations to ensure readily available time-series data. These indicators consist of the following variables: (a) foreign market GDP; (b) exports of goods and services as a percent of domestic GDP; (c) global terms of trade; (d) volume of world trade; and (e) FDI inflows as a percentage of domestic GDP.

The results generally support the use of these indicators in explaining income changes in the ASEAN-5 countries. The limitation of this approach, however, is the relatively long delay in the publication of information for the selected indicators compared with the more up-to-date information available for exchange rates, international prices and interest rates. These delays are important when data are used either to explain recent developments or to generate short-term forecasts. Nevertheless, the robustness of the estimates makes the approach useful in explaining movements in ASEAN-5 economic activity. Both exports and FDI changes are found to be significant in explaining real GDP changes. The export/GDP elasticities of the ASEAN-5 countries average 0.04 in the short run and then increase to 0.6 in the long run. Similarly, the short-term FDI/GDP elasticities average 0.03 in the short run and then increase to 0.2 in the long run. Only in the case of the Philippines are these variables not statistically significant. Instead movements in the global terms of trade and world trade volumes are found to be important in explaining GDP changes of that country.

We recommend extending the analysis of ASEAN global linkages in two areas. The first is the measurement of economic policy effects on growth. Balance of payments policies using trade policy instruments and capital controls have been found to play an important role in the macroeconomic histories of Southeast Asia and other developing regions. Financial policies are also likely to influence capital movements during tightening or liberalization episodes. Quantification of these policy effects would help to identify their impact on ASEAN economic activity. Similar econometric techniques could also be used to examine whether exchange rate policy differences among ASEAN countries explain divergent economic growth rates among these countries despite other similarities.

Another useful area of research would consider ASEAN global linkages based on estimates of the structural relationships in the economies of the member countries. It is likely that such an approach would yield more robust estimates of the international transmission mechanisms impacting on these countries than those based on reduced form equations.

I. ASEAN Global Economic Linkages

The link between the performance of the Association of Southeast Asian Countries (ASEAN) countries and global economic activity is central to the recovery of these countries. While the growth prospects of each country will undoubtedly build on expansionary domestic policies, they will also hinge on the recovery of exports and the return of foreign capital in the form of portfolio investment and foreign direct investment. These external conditions will be largely driven by global development, particularly in Japan, other Northeast Asian countries, the United States, the European Union, and within ASEAN. While the magnitude of these effects on the ASEAN countries can be broadly measured by the transmission of foreign income changes on domestic economic activity of those countries, there is no presumption about the direction and causality of those changes. Though the financial crisis in the Asian economies did not become a global crisis, it did slow the growth of the global economy by one-half of that it would otherwise have achieved.

The study is composed of the following parts: this section provides an introduction by examining the trend growth rates and year-to-year changes in the economic activity of the ASEAN-5 countries and the global regions. Section II reviews the literature on factors affecting the past performance of the ASEAN-5, particularly as they relate to the global economy, and it sets forth the main framework for analyzing the global determinants of economic growth in the ASEAN-5 (comprised of Indonesia, Malaysia, Philippines, Singapore and Thailand). Sections III and IV examine the international transmission of changes in income, exchange rates and other important determinants of ASEAN-5 economic growth, and present the empirical findings on the international transmission of income changes. Section V describes the other variables used in modeling the linkages and sets forth the empirical results. Section VI presents the conclusions. Details of the modeling methodology are laid out in the Technical Appendix.

The recent volatility of economic activity in the ASEAN countries makes the prediction of short-term activity a challenging one. While the systematic determinants of global linkages are relatively stable and robust, we are also interested in capturing the dynamics underlying rapidly changing variables to provide a relatively good explanation of recent developments and future short-term changes likely to affect these economies. To begin with, it is useful to see what phenomena have occurred in the ASEAN economies and what merits explanation from

a global perspective. Table 1.1 and Figure 1.1 show the dramatic long-term expansion of the ASEAN-5 in the last quarter century. Average annual growth during this period averaged nearly 6 percent for the combined real gross domestic product (GDP) of these

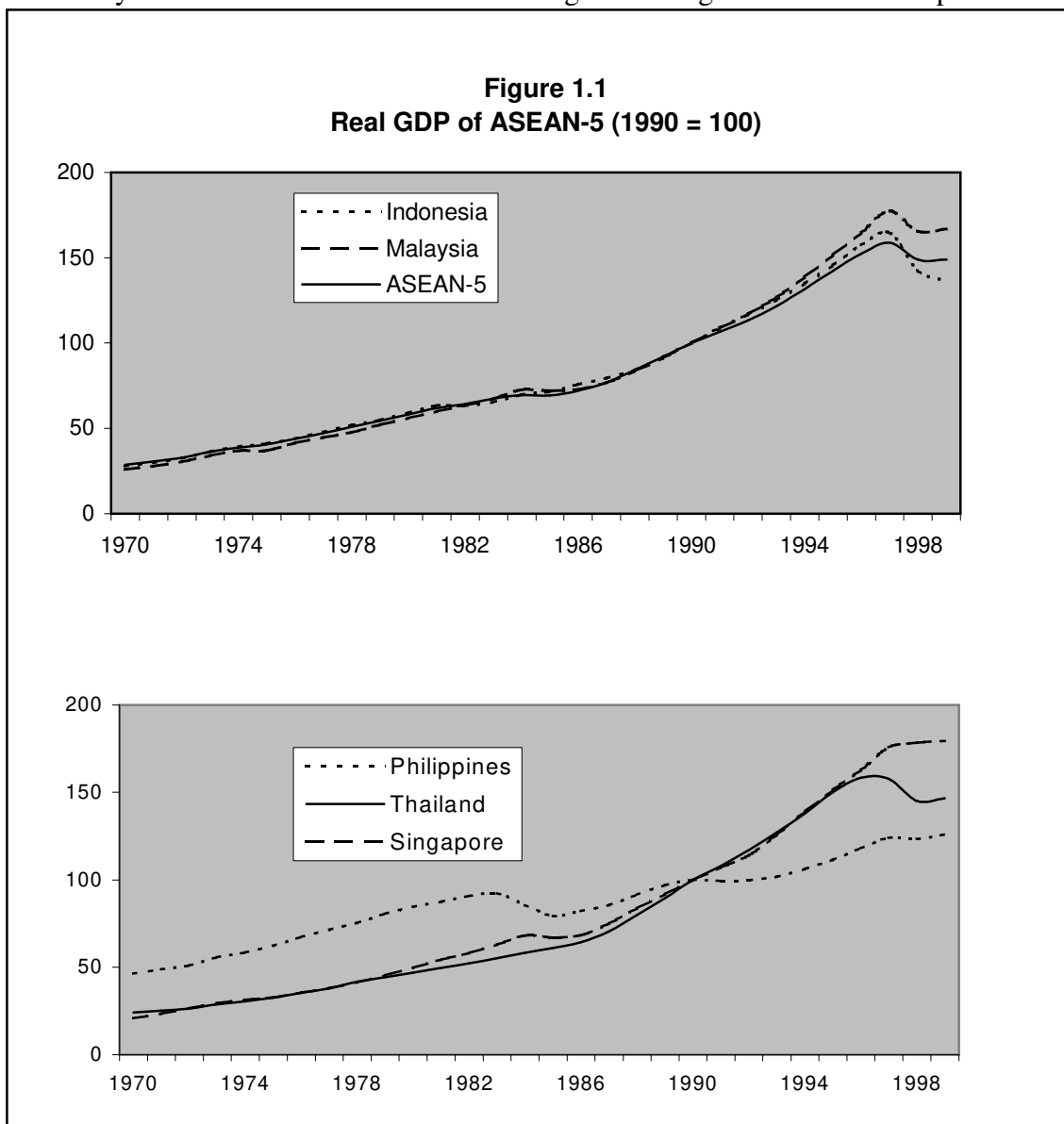
Table 1.1
ASEAN-5 Real GDP: Trend Growth Rates
and Average Annual Deviations

	Trend Growth	Average Deviation 1/	
		1970-97	1970-98
Singapore	7.5	3.3	3.3
Indonesia	6.1	4.0	4.4
Malaysia	6.5	4.4	4.4
Thailand	7.2	4.0	4.4
Philippines	3.0	7.0	6.9
Asean-5	6.0	3.5	3.7

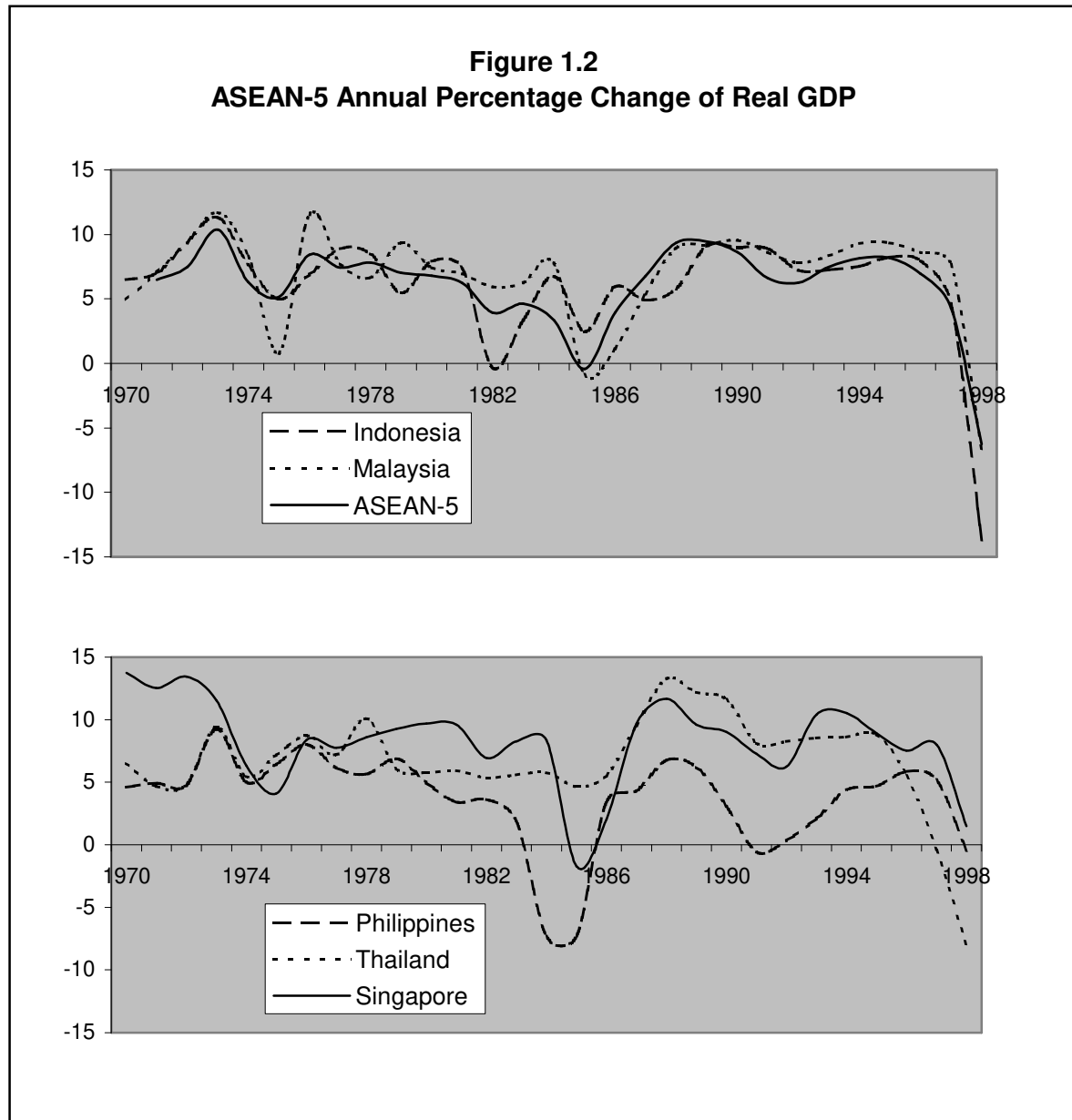
1/ Calculated from fitted trend.

countries, and ranged from 3.6 percent a year for the Philippines to 8 percent a year for Singapore.

The long-term positive trends make it difficult to distinguish short-term variations, so the year-to-year percentage changes in real GDP are shown in Figure 1.2. Despite the sharp movements in the series of Thailand, Singapore and Malaysia during the mid-1980s, and again in those of Indonesia and Thailand in 1998, year-to-year deviations over the entire period reveal a substantially different pattern from those limited to the mid-1980s. Singapore, which has experienced the highest growth rate, had the lowest deviation from that trend; in contrast, the Philippines, with the lowest growth rate, had the highest deviation from its trend. Indonesia and Thailand had similar short-term variations from their growth trend, although those of Thailand have occurred around a higher trend growth rate. In fact, Indonesia's short-term variations are similar to those of Malaysia after adjustment have been made for the trend growth rates, while Thailand has had relatively smaller deviations relative to its higher trend growth rate. These patterns hold,



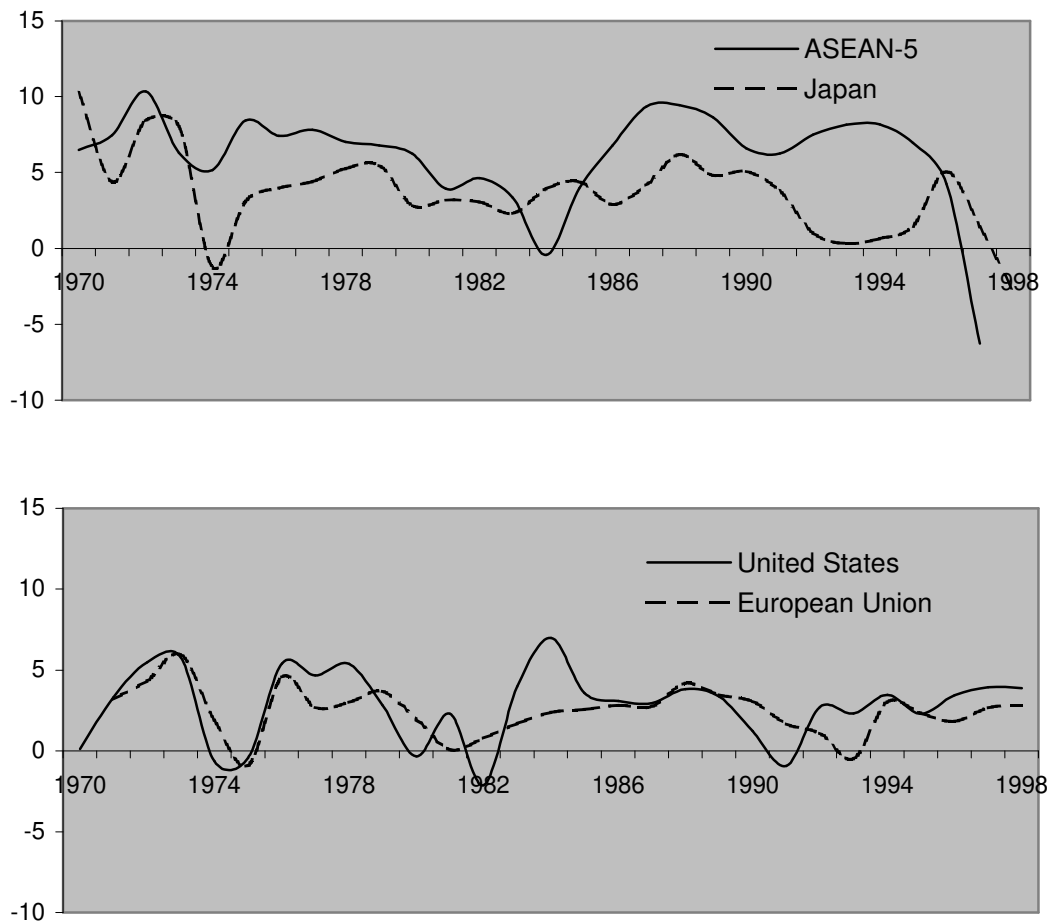
whether or not observations for 1998 are included in the calculations.



By way of comparison, annual percentage changes in the combined real GDP of the ASEAN-5 are plotted against those of the major global regions of Japan, the United States, and the European Union. Figure 1.3 shows that the series tend to be synchronous, although the rates of change of GDP in the ASEAN-5 tend to be more volatile than those of the major global regions. In general, changes in real GDP of the global regions tend to lead economic growth in the ASEAN-5, but generally grow at a slower rate. Thus, the data suggest a convergence of economic activity at the aggregate level between the ASEAN-5 and those global regions. These patterns require the careful interpretation of the various linkages between the ASEAN-5 and the major global regions in both their

long-term trends and short-term movements. The next section discusses the conceptual framework for modeling those linkages.

Figure 1.3
GDP Growth Rate of ASEAN-5
and Other Global Regions



II. The Global Framework of ASEAN

For purposes of framing the present analysis, we can distinguish three widely recognized explanations of economic growth in Southeast Asia. The first focuses on supply growth in the region to explain the 'Asian Miracle' associated with capital accumulation, the absorption or assimilation of increasingly modern technology and the change in industrial structures (Kim and Lau, 1994; Stiglitz, 1996; World Bank, 1993; Young, 1995). Whether driven by capital accumulation or by its productive assimilation, the growth process was accompanied by major changes in the structure of the Southeast Asian economies (Nelson and Pack, 1999). Notwithstanding the severe economic and financial crisis that hit all the countries in late 1997 and 1998, the view holds that the factors determining supply growth are largely in tact and will undoubtedly continue to influence the region under a favorable policy environment.

A closely related but more recent explanation is the fundamentalist view that structural factors have explained, first, the long-term growth of the Southeast Asian economies until mid-1997 and, second, the crisis in late 1997 and 1998. During the stellar years of the 'miracle' economies the dominant factors producing an outward-oriented, export-led growth were high domestic savings, human capital development, sound macro management and limited price distortions combined with careful policy interventions. During the 1997-98 crisis, structural factors also dominated events, but this time in the form of weak financial systems that were undermined by large capital flows and exchange rate misalignments. One explanation of these misalignments is the widespread use of relatively fixed exchange rate regimes. These regimes eventually needed to be reversed through the process of nominal and real depreciations of currencies that took place beginning in the latter part of 1997 (Krugman, 1998), Goldstein (1998), and Corsetti, Pesenti, and Roubini (1998).¹ An alternative explanation is that the cyclical variations in the real dollar-yen rate created the misalignment and impacted on trade, investment and capital flows of the Southeast Asian countries, rather than exchange rate mismanagement on the part of these countries (McKinnon, 1999, and Ohno, 1999). Dollar-yen rate variations are believed to have affected the region's international competitiveness, FDI flows, and short-term foreign currency indebtedness well before the crisis, and to have had a pervasive influence on the pattern of trade and investment in throughout the region.

¹ The other major explanation of the 1997-98 crisis focuses on the possible impact of expectations in the asset market as they affected the recent financial crisis in Asia (Sachs, 1997, and Stiglitz, 1997). These negative expectations reflected a lack of confidence in the asset market that led to panic liquidation in all the Southeast Asian stock markets. The liquidation, in turn, instigated large movements of funds offshore that reversed capital flows and drained official reserves. The resulting downward pressure on exchange rates was essentially domestically induced, although there were spillovers that gave rise to contagion and the pervasiveness of the Asian financial crisis. Since in this study we are concerned with real international product and financial linkages of the ASEAN-5, this interpretation of events during 1997-98 will not be examined here.

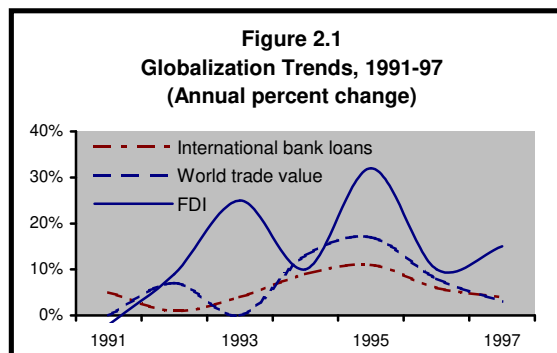
The third explanation of economic growth in Southeast Asia focuses on the rapid assimilation of the region in the global economy. While recognizing that industrial growth and transformation have been the driving force behind the economic growth of Southeast Asia, the handmaiden of that expansion has been the large growth of international trade and direct and portfolio investment generated by the rapid expansion of global production and markets. For the ASEAN-5 countries the systemic changes in the world economy have generated large volumes of international capital flows and transactions in goods and services, as well as generating a widespread diffusion of production, transportation, and communication technologies from corporate contracting arrangements. The introduction of new technologies through cross-border production networks and the dissemination of new skills in the workforce have now become as important to the specialization of production activities in the Asian economies as their capital, labor and natural resource endowments.

This new globalization process emphasizes demand-led growth and the policy environment as a critical determinant of that growth. Until roughly the mid-1980s many of the region's countries relied on exports as the main engine for economic growth, which implied a liberalization of trade and an emphasis on the facilitating role of the government. The shift from an export-driven growth strategy by many Asian countries to a growth strategy targeting global production and market networks was largely driven by efforts to exploit the worldwide growth of cross-border production and international capital movements. While the earlier outward-oriented strategy promoted economic growth in a number of Asian economies through the introduction of high value-added products into their economies, the new strategy has targeted the broad-based transmission of domestic learning and knowledge accumulation as a means of sustaining high economic growth rates.

Although all of the Southeast Asian economies initially embarked on import-substituting industrialization, over time they shifted to export-oriented industrialization policies, starting with Singapore in the late 1960s, followed by Malaysia, the Philippines, and

Table 2.1 Changing Exposure of ASEAN-5 Economies to Global Economy (Percentage)					
	Indonesia	Malaysia	Philippines	Singapore	Thailand
Trade Exposure <u>a/</u>					
1970-74	32.6	77.5	39.0	43.1	42.1
1975-79	37.8	90.3	45.6	61.3	47.8
1980-84	46.6	109.8	49.6	83.5	50.3
1985-89	44.4	117.7	52.2	78.1	59.1
1990-94	53.1	162.7	66.3	120.9	78.6
1995-97	53.0	183.0	84.8	148.0	85.8
Capital Exposure <u>b/</u>					
1970-74	n.a.	5.7	n.a.	8.8	n.a.
1975-79	n.a.	4.0	0.6	6.1	0.6
1980-84	n.a.	6.6	0.6	10.0	1.0
1985-89	n.a.	3.4	1.2	11.5	2.4
1990-94	1.8	6.2	2.2	11.8	3.2
1995-97	3.2	4.9	4.7	10.9	4.2
<u>a/</u> Trade exposure is measured as the sum of exports and imports relative to total GDP. <u>b/</u> Capital exposure is measured as the sum of FDI and portfolio capital relative to total GDP. Sources: International Monetary Fund (IMF), <i>International Financial Statistics</i> (various issues).					

Thailand in the 1970s, and finally Indonesia in the mid-1980s. Export-oriented industrialization led to an opening of the economies to more markets, and the promotion of foreign direct investment (FDI) as a means of upgrading the industrial structures through the transfer and diffusion of advanced industrial technologies. As a result, the exposure of the economies to foreign trade and capital has grown dramatically in the last quarter century, although it has been most pronounced in Malaysia and Singapore (Table 2.1).



large changes in the trade and cross-border production activities (Figure 2.1). Year-to-year variations around the 15 percent annual growth rate of international production equaled ± 9 percent, while those around the 6 to 7 percent trend growth rates of net international bank lending and world trade equaled ± 3 and ± 5 percent respectively.

The focus of this study is on demand-led growth in the ASEAN-5 economies in the context of the global economy. In examining linkages between the ASEAN-5 and the global economy, our focus is on the short-term or year-to-year impact of the global economy on real effective exchange rates, trade balances, international capital flows and changes in the structure of production, trade and investment in the ASEAN-5 economies. Notwithstanding the pervasive influence of the 1997-98 crisis on short-term movements in the near term, today's global linkages are rooted in behavioral relationships that have developed since the 1970s and 1980s. Our interest is therefore to identify and quantitatively represent the essential features that underlie the international transmission of economic activity, as distinct from an attempt to describe the complete ASEAN system of economic growth. As such, the set of causal relationships is parsimonious and does not explicitly consider the determinants of either supply growth or structural factors.

In the next section we quantify the impact of the international transmission of income changes on the economic growth of the ASEAN-5 countries and examine the major determinants of the international transmission process. The empirical investigation economic follows the conventional approach to modeling the transmission of changes in economic activity between countries. The magnitude of these transmissions to the ASEAN-5 can be broadly measured by the impact that foreign income changes have on the domestic economic activity of those countries. The transmission of foreign income changes is complex and when those changes are sufficiently widespread they can also affect market prices of traded products by the ASEAN-5, as well as FDI inflows that are either directed toward international markets or rely on foreign inputs.

In addition to the transmission of income changes, we include in the model other determinants of trade and capital flows impacting on the economic growth of the ASEAN-5. For trade, the two other major determinants of demand considered are relative prices of traded products, or the terms of trade, and the real effective exchange rate of each ASEAN-5 country. For capital flows, including portfolio investment and direct investment, the other determinants considered are real interest rate differentials, the real exchange rate, and the risks associated with portfolio and direct investment. That risk is measured by real exchange rate fluctuations, or more generally, imbalances in the balance of payments that reflect the risk of real exchange rate changes and/or capital controls.

III. International Transmission of Income Changes

The major regional global linkages of the ASEAN-5 countries are fairly evenly distributed among Japan, the United States, the European Union, other Northeast Asia, other ASEAN-5, and the rest-of-the-world. These linkages reflect trade, as shown in Table 3.1. Capital flows are more concentrated in the industrialized countries, especially Japan. For example, according to IMF (1998) data, Thailand's FDI inflows in 1997 were mainly from Japan (36 percent of the total), the United States (18 percent) and the European Union (11 percent). The composition of these linkages, however, has changed considerably in the last two decades. In trade Japan accounted for nearly one-fourth of ASEAN-5 combined exports and imports in 1980, compared with 17 percent in 1997 and 14 percent in 1998. The declining importance of Japan has been reflected in trade of all countries, other than Singapore, but none more than Indonesia, which lowered its share from 48 to 17 percent between 1980 and 1998. In contrast, all countries in the region have increased their trade shares with other Northeast Asian countries and other ASEAN-

Table 3.1 ASEAN-5 Distribution of Trade, 1998 (Percentages)							
Exports+Imports to: by:	Intra- ASEAN5	Japan	Other NE Asia ^{a/}	United States	European Union	Other	Total
Indonesia	18%	17%	14%	13%	16%	22%	100%
Malaysia	28%	13%	11%	18%	13%	18%	100%
Philippines	13%	16%	12%	25%	12%	22%	100%
Singapore	23%	11%	13%	18%	14%	21%	100%
Thailand	16%	17%	10%	17%	16%	24%	100%
ASEAN-5	21%	14%	12%	18%	14%	21%	100%
^{a/} Comprises Hong Kong SAR, Korea, the Peoples Republic of China (PRC), and Taipei, China. Source: International Monetary Fund (IMF), <i>Direction of Trade Statistics</i> (June 1999).							

5 countries. Overall trade shares with the United States and the European Union have remained nearly unchanged. Since estimates of global regional linkages require fairly long time series, calculations will more closely reflect the weights of the regions at the mid-point of the time series than the current ones.

Our estimates of the international transmission of income and other changes on the ASEAN-5 countries separate the long-run or equilibrium relationships between domestic income and foreign income, prices and other variables from the short-run or dynamic disequilibrium components of those relationships. We examine global linkages of the ASEAN-5 using an Equilibrium Correction Mechanism (ECM) specification that provides the means by which the short-run observed behavior of variables is associated with their long-run equilibrium growth paths. The ECM adjusts for any disequilibrium between variables that are cointegrated. As a result, it provides the means by which the short-run observed behavior of variables is associated with their long-run equilibrium growth paths. A closely related specification known as the "error-correcting mechanism"

(also having the acronym ECM) models both the short and long-run relationships between variables.

To illustrate the adjustment process of these transmissions, we can estimate the simple relationship of real GDP growth of all ASEAN-5 countries to changes in real GDP growth in all the global regional economies (Japan plus US plus EU). Let the variable Y represent the real GDP growth of the ASEAN-5 and Z represent the real GDP growth of the global regional economies. The resulting estimate of the ECM relationship between these two variables for 1971-98 is as follows (see the Technical Appendix for a description of the ECM):

$$\Delta y_t = -1.77 - 0.11(y - z)_{t-1} + 0.51\Delta z_t + 0.14z_{t-1} \quad (3.1)$$

(2.4) (2.7) (2.4)

$$R^2 = 0.83 \quad dw = 1.3 \quad SE = 0.014$$

where lower-case letters denote the logarithms of the corresponding capitals, the t -statistics are shown in parentheses, R^2 is the corrected squared multiple correlation coefficient, dw is the Durbin-Watson statistic, and SE is the standard deviation of the residuals. Despite the statistical significance of the Δz variable, the equation failed to predict the changes in income in 1985 and 1998. It seriously overestimated real GDP of the ASEAN-5 in 1985 and 1998, and hence binary variables were used to account for the effects of other variables in those two years. Notwithstanding these limitations, the short and long-run dynamic properties of the estimated relationship in the ECM can be examined.

The estimated equation yields a short-term elasticity of 0.51 long-run elasticity of 2.27 ($= 1 + 0.14/0.11$) with respect to real GDP of the global regional economies. The growth rate of the selected global regional economies is given by Δz , whose steady-state path can be denoted g . A constant growth rate of $g = \Delta z$, yields the long-run dynamic relationship:

$$Y = kZ^{2.27} \quad (3.2)$$

where $k = \exp\{[-1.77/-0.11] + [-0.11-.51x(-0.11)-0.14]/-0.11^2\}g = \exp(16.09 - 16.02)g$. Since $g = 2.8$ percent was the average growth rate of real GDP in the global regional economies during the period 1971-98, then $k = 0.03$ and the ratio of real GDP of the ASEAN-5 to that of the selected global regional economies equals 1.68 percent, which approximates the average ratio in 1971-98. The ASEAN-5's real GDP growth is therefore shown to be influenced by changes in both the level and rate of growth of real GDP in the global regional economies.

Table 3.2 shows the regression estimates for the ECM representation of the relationship between changes in real GDP in each ASEAN-5 country and changes in real GDP of the three global regions. In general, the low power of the R^2 and dw statistics suggest left-out variables.

Table 3.2**Regression Results of ASEAN-5 GDP Relationships to Foreign Income**

$$\Delta y_t = \alpha_0 + \alpha_1(y - z)_{t-1} + \alpha_2\Delta Z_t + \alpha_3Z_{t-1} + v_t$$

						Summary Statistics			
ASEAN-5	Global Region	$\ln(Y/Z)_{t-1}$	$\Delta \ln(Z)_t$	$\ln Z_{t-1}$	Const	R^2	dw	SE	dof
Indonesia	Japan	-0.21 (2.1)	0.84 (2.4)	0.14 (1.9)	-1.95	0.41	1.22	0.04	24
	United States <u>a/</u>	-0.05 (0.8)	0.29 (1.3)	0.05 (0.6)	-1.03)	0.80	1.14	0.02	23
	European Union	-0.34 (2.3)	0.32 (0.6)	0.49 (2.0)	-5.91	0.26	1.21	0.04	24
	World <u>a/</u> , <u>b/</u>	-0.08 (1.4)	0.28 (1.1)	0.10 (1.3)	-1.42	0.84	1.26	0.02	23
Malaysia	Japan	-0.14 (1.8)	0.60 (1.9)	0.12 (1.8)	1.58	0.30	1.42	0.03	24
	United States	-0.05 (0.5)	0.32 (0.8)	0.03 (0.2)	-0.47	0.10	1.34	0.04	24
	European Union	-0.21 (2.1)	0.77 (1.6)	0.37 (2.0)	-4.27	0.24	1.26	0.04	24
	World <u>a/</u> , <u>c/</u> , <u>d/</u>	-0.05 (1.0)	0.79 (3.7)	0.09 (1.4)	-1.13	0.82	2.3	0.02	22
Philippines	Japan	-0.14 (1.7)	0.17 (0.5)	-0.05 (1.8)	-0.13	0.21	0.87	0.04	24
	United States	-0.17 (2.2)	0.14 (0.5)	-0.03 (0.9)	-0.53	0.24	0.98	0.04	24
	European Union	-0.18 (2.0)	0.37 (0.7)	0.01 (0.2)	-0.92	0.26	0.90	0.04	24
	World <u>e/</u> , <u>f/</u> , <u>g/</u>	-0.14 (1.3)	0.25 (0.4)	-0.04 (1.1)	-0.35	0.51	1.58	0.03	18
Thailand	Japan	-0.18 (2.8)	0.89 (3.2)	0.20 (3.0)	-2.27	0.46	0.68	0.03	24
	United States	-0.07 (0.8)	0.24 (0.6)	0.09 (0.6)	-1.09	0.09	1.60	0.04	24
	European Union	-0.19 (1.9)	0.51 (1.0)	0.39 (1.8)	-4.27	0.16	0.63	0.04	24
	World <u>h/</u>	-0.15 (1.6)	0.58 (1.2)	0.25 (1.6)	-3.23	0.10	0.88	0.04	24
Singapore	Japan	-0.08 (1.1)	0.46 (1.7)	0.08 (0.9)	-0.92	0.22	1.16	0.03	24
	United States	-0.06 (0.7)	0.01 (0.1)	0.08 (0.5)	-0.90	0.09	1.19	0.03	24
	European Union	-0.15 (1.7)	0.68 (1.6)	0.30 (1.5)	-3.31	0.21	1.15	0.03	24
	World <u>a/</u> , <u>c/</u> , <u>i/</u>	-0.03 (0.5)	0.43 (0.9)	0.05 (0.4)	-0.66	0.55	1.88	0.02	13

Notations (lower-case letters denote logarithms of upper-case letters):

Y = Domestic GDP

Z = Foreign GDP

a/ Includes a binary variable for 1998 (1 in 1998; 0 otherwise).

b/ Includes a binary variable for 1982 (1 in 1982; 0 otherwise).

c/ Includes a binary variable for 1985 (1 in 1985; 0 otherwise).

d/ Includes a binary variable for 1986 (1 in 1986; 0 otherwise).

e/ Includes a binary variable for 1984 (1 in 1984; 0 otherwise).

f/ Includes a binary variable for 1991 (1 in 1991; 0 otherwise).

g/ Includes a binary variable for 1992 (1 in 1992; 0 otherwise).

h/ Includes a binary variable for 1997 (1 in 1987; 0 otherwise).

i/ Includes a binary variable for 1993 (1 in 1983; 0 otherwise).

Notes: R^2 is the adjusted R^2 ; figures in parentheses below the coefficients are t-statistics.

Table 3.3			
Foreign Income Elasticities			
ASEAN-5	Global Region	Short-Term Elasticity	Long-Term Elasticity
Indonesia	Japan	0.84	1.66
	United States	0.29	2.06
	European Union	0.32	2.47
	World	0.28	2.22
Malaysia	Japan	0.60	1.86
	United States	0.32	1.69
	European Union	0.77	2.77
	World	0.79	2.99
Philippines	Japan	0.17	0.62
	United States	0.14	0.83
	European Union	0.37	1.04
	World	0.25	0.69
Thailand	Japan	0.89	2.11
	United States	0.24	2.27
	European Union	0.51	3.01
	World	0.58	2.67
Singapore	Japan	0.46	1.98
	United States	0.00	2.19
	European Union	0.51	3.01
	World	0.43	2.62
Note: The elasticity measures the percentage change in real GDP of each ASEAN-5 country brought about by a 1 percent change in the real GDP growth of each global region, namely, Japan, the United States, the European Union and the World.			

As expected, the relationships between each of the ASEAN-5 and Japan are more robust than those between the region and the United States and the European Union. Since the growth rates of all the ASEAN-5 countries are of integrated order $I(2)$ and that of Japan is also $I(2)$, the individual coefficient estimates are robust. In contrast, the coefficient estimates for the relationship between economic growth of the ASEAN-5 countries and those of the United States and the European Union are much less robust and the individual coefficient estimates are often not significantly different from zero.

Despite the lack of consistently robust estimates, the results point to a number of conclusions about the relationship between ASEAN-5 economic growth and foreign income growth in the United States, Japan, and the European Union. As Table 3.3 shows, the foreign income elasticities for the ASEAN-5 countries are consistent with expectations. The short-term foreign income elasticities have a mean average of 0.43, and they range from near 0 for the relationship between Singapore and the United States to 0.89 for that between Thailand and Japan. The long-term foreign income elasticities have a mean average of 1.97, and they range from 0.62 for the relationship between the Philippines and Japan to over 3.0 for Singapore with that of the European Union.

Among the individual ASEAN-5 countries, the Philippines has the lowest average foreign income elasticity in both the short run (0.23) and long run (0.83). In the short run, Thailand and Malaysia have the largest short-term average foreign income elasticities

(0.55 and 0.56 respectively), while Thailand has the largest average long-term elasticity (2.46), followed by Singapore (2.39). Among the global regions, the United States has the smallest foreign income elasticity in the short run (1.98) while Japan has the largest short-term elasticity (0.59). That of the European Union is 5.0 in the short run. In the long-run, Japan has the smallest income elasticity (1.65), while the European Union has the largest elasticity (2.46). That of the United States is equal to 1.81. Estimates of the international transmission of income changes based on aggregate data from all the regions show a similar pattern as those for individual regional estimates.

IV. Transmission Effects of Bilateral Exchange Rate Differentials

Real effective exchange rate movements favored economic growth in the ASEAN-5 countries in the 1980s and until 1996, despite the loss of competitiveness in some regional markets. Up to the mid-1990s, export growth was favorably affected by improvements in the ASEAN-5's international competitiveness, and foreign investment grew from the relative strength of foreign currencies and favorable export prospects. However, the situation reversed itself in the mid-1990s when a gradually widening differential between the inflation rates of the ASEAN countries and major trade and investment partners caused the real effective exchange rates of the ASEAN-5 countries to appreciate. The resulting deterioration in export competitiveness led to large increases in the current account deficit of the region as a whole, and Malaysia and Thailand in particular.

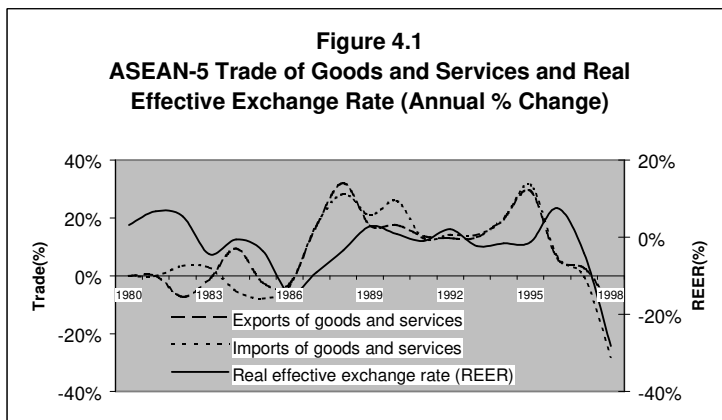


Figure 4.1 plots the trade-weighted average real effective exchange rate (REER) of the ASEAN-5 countries against their imports and exports. The REER is the nominal effective exchange rate adjusted for relative movements in the national prices of home and partner countries.¹ An increase in the index reflects an

appreciation or revaluation and a decline denotes a devaluation or depreciation. For the ASEAN-5 countries as a whole the devaluation of their REER in the 1980s was followed by large increases in exports of goods and services. In the first half of the 1990s, however, the ASEAN-5's REER remained almost unchanged as devaluations of the currencies of Indonesia, Malaysia and Thailand were offset by appreciations in those of the Philippines and Singapore. Exports of all countries nevertheless surged during this period, particularly in Malaysia, Thailand and Singapore. In 1996 all ASEAN-5 currencies appreciated in real terms and, with the exception of Singapore, they all devalued sharply in 1997-98. Exports since 1996 have stagnated and have yet to respond

¹ The real exchange rate is defined as $e^r_t = P_t/(e^r_t P^f_t)$, where e^r is the nominal exchange rate, P^f is the foreign currency price of goods purchased abroad, and P is the domestic price level. A rise in e^r represents a real *revaluation* under a fixed exchange rate system, and an *appreciation* under a flexible exchange rate system. The rise is associated with either a rise in the nominal exchange rate e^r or a rise in relative prices of domestic goods (equivalent to a fall in relative prices of foreign goods). Conversely, a fall in e^r represents a real *devaluation* in a fixed exchange rate system, and a *depreciation* in a flexible exchange rate system, which can be brought about by either a fall in the nominal exchange rate e^r , or a rise in the relative price of foreign goods (equivalent to a relative fall in the price of domestic goods).

Table 4.1
Nominal Exchange Rate Indices, 1980-98
(Local currency units per US\$, 1990=100)

	Japan	Other NE Asia	European Union	ASEAN-5
1980	157	60	93	93
1981	152	69	114	94
1982	172	75	129	98
1983	164	86	142	99
1984	164	89	159	99
1985	165	92	165	104
1986	116	98	129	105
1987	100	98	110	103
1988	89	102	107	102
1989	95	99	114	102
1990	100	100	100	100
1991	93	104	103	99
1992	87	107	99	94
1993	77	110	111	95
1994	71	124	110	94
1995	65	122	101	90
1996	75	124	103	91
1997	84	132	113	102
1998	90	156	115	145

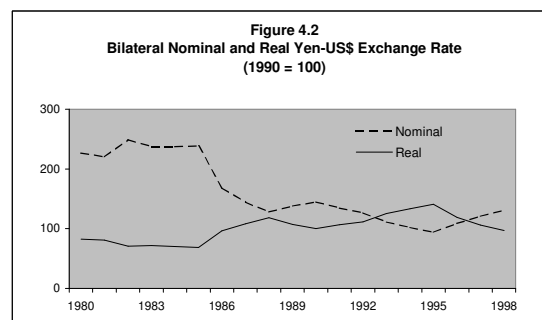
Note: Regional averages are trade-weighted by total trade (imports plus exports) of ASEAN-5 countries.
Source: Derived from IMF, *International Financial Statistics* data.

to the sharp devaluations during 1997-98. Imports, however, did fall sharply in 1998. In Indonesia, for example, the cutbacks in imported inputs following the 80 percent devaluation of the rupiah against the US dollar in early 1998 caused many manufacturing industries engaged in assembly production to reduce production or cease production altogether. These industries included both export-oriented industries engaged in textile, garment, footwear, and consumer electronics production, and domestic market-oriented industries such as the steel, automotive and pharmaceutical industries (Thee, 1999).

Because most of the ASEAN-5 countries indirectly pegged their exchange rates to the US dollar, their currencies followed the US dollar down against the Japanese yen in the first half of the 1990s and then reversed that trend in the second half of the decade (Table 4.1).^{2 3} After adjusting for inflation differences in Japan and the United States, the real cross-rate of the

yen against the dollar appreciated by over 40 percent in 1990-95 and then depreciated by over 30 percent in 1995-98 (see Figure 4.2). In the EU market the average nominal exchange rate experienced relatively large year-to-year fluctuations against the dollar and showed no clear trend between 1987 and 1996. Only in the important markets of Mainland China and Korea did countries with dollar-pegged currencies improve their export competitiveness.

At the same time, the ASEAN-5 countries' higher rates of inflation than in the industrialized countries caused their REER in the US market to appreciate in the latter part of the 1980s and early 1990s (Table 4.2). For the ASEAN-5 region as a whole the REER fell by over 30 percent in the US market between 1980 and 1989,



² Note that Table 4.1 contains information on nominal exchange rates. As such, a rise in the exchange rate represents a nominal *devaluation* in a fixed exchange rate system, and a nominal *depreciation* in a flexible exchange rate system. Alternatively, a fall in the exchange rate represents a nominal *revaluation* under a fixed exchange rate system, and a nominal *appreciation* under a flexible exchange rate system.

³ For a review of the exchange rate regimes in Southeast Asia through the mid-1990s, see Bénassy-Quéré (1996).

but then appreciated by 22 percent between 1989 and 1996. In the EU market the dollar appreciation combined with relative price movements of the ASEAN-5 to produce major swings in the region's bilateral REER with that market. In the first half of the 1980s the bilateral REER appreciated by 65 percent, it then plummeted by nearly 50 percent in the second half of the 1980s, and in the first half of the 1990s it appreciated by 20 percent. Bilateral REER movements in the Northeast Asian market as a whole appeared to be more modest, but only because the large REER appreciation in the Mainland China market during 1980-94 was offset by a large REER devaluations in the Korean market. The largest changes in ASEAN-5's bilateral REERs occurred in the Japanese market, where the bilateral REER experience an almost uninterrupted fall between the early 1980s and the mid-1990s. Overall the bilateral REER of the ASEAN-5 with the Japanese yen fell by 70 percent between 1982 and 1995.

Apart from strengthening the demand exports, the ASEAN-5 countries benefited from large-scale capital inflows as a result of exchange rate realignments with the Japanese yen in the early 1990s, as Japanese investors took advantage of relatively low dollar-

Table 4.2
ASEAN-5 Real Effective Exchange Rates (REER) by Region, 1970-98 (1990=100)

	Indonesia					Malaysia					Philippines				
	World	Japan	Other NE Asia	US	EU	World	Japan	Other NE Asia	US	EU	World	Japan	Other NE Asia	US	EU
1970	191	316	116	148	213	61	483	116	78	65	114	204	68	95	138
1971	173	280	109	137	190	65	461	109	79	62	121	208	74	102	141
1972	156	232	104	133	166	75	403	104	92	67	116	179	72	103	128
1973	171	244	121	165	179	93	432	121	123	82	115	166	72	112	122
1974	206	299	150	208	228	97	514	150	126	89	134	193	86	134	147
1975	227	324	171	227	234	100	536	171	128	92	122	175	82	123	126
1976	261	355	194	258	280	97	475	194	113	110	123	171	85	124	134
1977	259	330	197	269	279	101	415	197	121	121	122	158	86	128	132
1978	220	252	182	254	240	103	288	182	136	118	114	128	85	129	120
1979	178	219	141	197	179	115	350	141	153	116	125	151	90	136	122
1980	192	247	152	205	190	116	379	152	154	112	132	168	95	139	127
1981	175	255	167	206	233	124	320	167	138	148	134	167	102	135	154
1982	199	294	182	208	259	140	397	182	134	190	140	188	103	133	164
1983	186	223	149	160	222	159	365	149	136	256	118	148	111	107	145
1984	182	214	157	150	232	175	358	157	133	319	111	145	98	102	156
1985	176	204	158	141	223	174	322	158	119	310	120	158	111	109	171
1986	134	131	139	126	155	134	149	139	110	179	103	102	114	98	120
1987	103	96	114	104	111	124	115	114	115	140	98	90	110	98	104
1988	100	89	115	105	111	105	84	115	107	120	97	84	109	99	104
1989	101	95	103	102	116	104	91	103	100	129	104	96	103	103	117
1990	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1991	97	93	100	99	102	93	84	100	97	101	100	95	101	101	103
1992	94	89	100	99	97	101	86	100	113	110	110	103	114	115	111
1993	96	82	103	103	112	94	65	103	110	133	106	90	106	113	121
1994	94	79	106	105	112	85	53	106	106	124	111	92	107	123	130
1995	91	76	101	108	104	82	49	101	117	113	114	94	107	133	129
1996	99	91	102	108	110	91	65	102	116	118	124	116	109	137	137
1997	90	86	90	91	103	85	65	90	92	114	121	118	105	125	140
1998	45	43	47	42	48	52	39	47	48	60	101	100	95	97	109

Note: The real effective exchange rate (REER) indices are calculated from real cross-rates for individual trading partners of each ASEAN-5 country, weighted by the relative importance of each export market in the corresponding year.

(Continued)

Table 4.2 (continued)
ASEAN-5 Real Effective Exchange Rates (REER) by Region, 1970-98 (1990=100)

	Singapore					Thailand					ASEAN-5 ^{a/}				
	World	Japan	Other NE Asia	US	EU	World	Japan	Other NE Asia	US	EU	World	Japan	Other NE Asia	US	EU
1970	89	182	54	85	115	128	227	74	106	154	103	270	48	99	111
1971	87	170	54	83	109	122	209	72	102	142	103	250	50	98	105
1972	87	156	55	90	106	115	180	69	104	129	105	216	53	103	104
1973	101	171	65	115	123	111	169	67	114	124	117	223	59	126	116
1974	109	184	74	128	137	122	185	76	129	140	130	259	66	144	131
1975	106	177	74	124	125	116	177	75	124	127	130	259	67	142	125
1976	99	152	69	110	118	117	169	77	122	130	128	251	64	136	133
1977	94	133	66	108	111	113	152	76	124	124	125	226	63	139	132
1978	93	112	70	113	107	106	124	74	124	114	121	180	63	143	124
1979	93	123	71	111	100	107	136	72	122	109	121	185	64	140	117
1980	93	130	71	108	98	116	156	76	129	117	125	204	65	141	117
1981	100	132	82	107	120	123	153	83	123	141	133	200	79	137	148
1982	102	149	85	105	130	121	166	82	118	145	140	230	85	135	165
1983	102	143	92	103	141	129	163	96	117	160	134	198	90	121	177
1984	102	142	90	100	154	125	156	95	110	168	133	196	95	116	194
1985	100	136	88	94	148	112	137	93	94	150	129	185	100	108	186
1986	93	95	98	92	114	104	101	106	97	120	110	116	106	102	133
1987	90	85	100	92	99	98	91	104	98	105	100	94	106	99	109
1988	91	79	103	94	99	97	84	110	100	105	97	84	108	99	106
1989	95	88	95	95	108	100	92	100	99	113	99	92	98	98	115
1990	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1991	104	98	105	104	106	100	95	102	102	104	99	93	103	101	104
1992	105	98	109	110	107	98	92	103	103	100	101	92	109	108	104
1993	104	88	103	110	119	96	83	99	104	112	99	80	107	108	119
1994	107	87	102	117	124	95	80	100	107	114	97	74	110	112	120
1995	108	88	100	124	121	94	79	98	111	108	96	71	107	119	114
1996	111	104	98	123	125	101	95	95	113	114	103	88	107	119	119
1997	113	110	94	117	130	91	88	81	94	105	99	88	99	104	118
1998	109	104	90	102	115	80	78	70	76	86	71	62	77	69	77

^{a/} Trade-weighted average of individual country real effective exchange rates, where trade measured by the sum of exports and imports of goods and services.

Note: The real effective exchange rate (REER) indices are calculated from real cross-rates for individual trading partners of each ASEAN-5 country, weighted by the relative importance of each export market in the corresponding year.

related production costs in the region. The investment boom that followed was facilitated by the liberalization of internal and external financial controls in most of ASEAN-5 countries. Asset prices rose with the surge in the markets for stocks and real estate. As bank lending escalated to finance stock and real estate purchases, local financial institutions borrowed short from foreign capital sources and lent long for domestic asset purchases, therefore spreading the term structure of borrowing and lending (Corsetti, Pesenti and Roubini, 1998). As a result, the share of portfolio investment in the capital inflows of the ASEAN-5 increased relative to FDI and other capital flows (Table 4.3). For the ASEAN-5 countries as a whole, the share of portfolio investment in the capital account rose from near zero in 1990-91 to 20 percent in 1996. In Indonesia and the Philippines the share of portfolio investment surged to around 40 percent in 1996.

Table 4.3
Capital Inflows by Type, 1985 - 1997
(Millions of US dollars)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
VALUE OF INFLOWS:													
Indonesia	1,782	4,177	3,481	2,217	2,918	4,495	5,697	6,129	5,988	4,448	10,862	11,447	-429
Foreign direct investment	310	258	385	576	682	1,093	1,482	1,777	2,004	2,109	4,346	6,194	4,673
Portfolio investment	-35	268	-88	-98	-173	-93	-12	-88	1,805	3,877	4,100	5,005	-2,632
Other investment liabilities	1,507	3,651	3,184	1,739	2,409	3,495	4,227	4,440	2,179	-1,538	2,416	248	-2,470
Malaysia	1,774	1,050	-989	-918	1,303	1,989	4,664	7,244	11,738	784	8,422	9,418	3,732
Foreign direct investment	695	489	423	719	1,668	2,332	3,998	5,183	5,006	4,342	4,178	5,078	5,106
Portfolio investment	1,942	30	140	-448	-107	-255	170	-1,122	-709	-1,649	-436	-268	-248
Other investment liabilities	-862	531	-1,551	-1,189	-258	-89	496	3,183	7,441	-1,909	4,679	4,607	-1,126
Philippines	340	146	320	572	1,368	2,057	2,942	3,323	4,590	6,054	7,137	13,013	6,218
Foreign direct investment	12	127	307	936	563	530	544	228	1,238	1,591	1,478	1,517	1,222
Portfolio investment	17	13	21	51	294	-50	125	155	897	901	2,619	5,126	600
Other investment liabilities	311	6	-8	-415	511	1,577	2,273	2,940	2,455	3,562	3,040	6,370	4,396
Singapore	3,532	3,221	3,015	4,022	10,675	7,812	1,706	8,703	15,877	14,392	20,280	23,232	46,062
Foreign direct investment	1,047	1,710	2,836	3,655	2,887	5,575	4,887	2,204	4,686	8,368	7,386	7,444	8,631
Portfolio investment	521	-261	320	36	375	573	-242	1,398	2,867	114	410	1,672	938
Other investment liabilities	1,964	1,772	-141	332	7,413	1,664	-2,940	5,101	8,324	5,911	12,484	14,116	36,492
Thailand	1,781	20	1,091	3,595	6,962	9,402	11,575	9,517	13,998	13,691	25,534	17,797	-13,637
Foreign direct investment	163	263	352	1,105	1,775	2,444	2,014	2,113	1,804	1,366	2,068	2,336	3,746
Portfolio investment	895	-29	346	530	1,486	-38	-81	924	5,455	2,486	4,083	3,585	4,798
Other investment liabilities	722	-213	393	1,960	3,700	6,996	9,642	6,479	6,739	9,839	19,383	11,876	-22,181
ASEAN-5	9,210	8,614	6,918	9,488	23,226	25,754	26,583	34,917	52,192	39,370	72,234	74,907	41,945
Foreign direct investment	2,227	2,847	4,303	6,992	7,575	11,974	12,926	11,506	14,738	17,776	19,456	22,569	23,378
Portfolio investment	3,340	20	738	71	1,875	137	-40	1,267	10,316	5,729	10,776	15,120	3,456
Other investment liabilities	3,643	5,747	1,877	2,426	13,776	13,644	13,698	22,144	27,138	15,865	42,002	37,217	15,111

Source: IMF, *International Financial Statistics* (June 1999).

When interest rates in the United States rose in early 1997 portfolio adjustments in the United States led to large fund withdrawals from the Southeast Asian region (McKibbin, 1998). Prior to this event, conditions in the external sectors of the ASEAN-5 had already begun to deteriorate. Export growth was slowing down because of real appreciations of the ASEAN-5 currencies during 1996, the deceleration in the growth rate of Japan's domestic absorption, and large world market price declines in key primary commodity exports of the ASEAN-5 (Marcus *et al.*, 1998). In Japan the real depreciation of the yen against the dollar beginning in 1996 affected the East Asian economies in three ways. First, it reduced the competitive position of the dollar-pegged East Asian economies in the Japanese market, thereby worsening their trade balance with that important trading partner. Second, Japanese companies reduced their investments in East Asia as the dollar strengthened against the yen and escalated the cost of Japanese outsourcing in these

dollar-pegged economies. Third, the long-term upward movement in the nominal dollar value of the yen drove nominal interest rates on yen-denominated assets below those prevailing on dollar-denominated assets (McKinnon and Ohno, 1997, 1998). The resulting interest rate differential induced banks in East Asia to undertake additional foreign currency indebtedness by accepting cheap yen deposits without covering their foreign exchange risk.

With expectations of growth revised downward in 1997, the stock markets in Thailand, Malaysia and the Philippines fell steadily throughout the year, and that of Indonesia followed the downward spiral during the second half of that year. Domestic and foreign investors moved their funds offshore and the resulting net capital outflow drained official reserves in these countries. Without the reserves needed to defend their currencies, Thailand, Malaysia, the Philippines and Indonesia abandoned the dollar peg and sharply devaluated their currencies. With the large spread in the term structure of foreign denominated debt and lending for domestic assets purchases, financial intermediaries in these countries found themselves confronting huge debt burdens. The financial panic of international investors that followed sharply reversed international capital flows and led to wide-ranging competitive devaluations (Goldstein, 1998).

Notwithstanding the contagion of 1997-98, the informal pegging of currencies to the US dollar within the ASEAN-5 region had kept bilateral real exchange rate movements fairly stable. For this reason, McKinnon (1999) has maintained that the pegging of the East Asian currencies to the dollar anchored domestic price levels in those countries and insulated them from beggar-thy-neighbor devaluations during the region's rapid growth in the 1980s through 1996. In a similar vein, Ohno (1999) has argued that the widespread use of dollar invoicing of foreign trade by East Asian countries protected them against competitive devaluations by neighboring countries until the abandonment of the dollar pegs during the 1997-98 crisis. This situation also led to the buildup of short-term foreign currency indebtedness because of the lack of capital controls in the balance of payments or bank regulations requiring banks and corporations to cover their foreign currency and term structure risks. According to McKinnon, the inadequate regulations and excessive interest rate disparities were the factors that led to over-borrowing and the accumulation of short-term debt.

In the next section we attempt to quantify the effects of these price variables on the ASEAN-5 economies as manifested from movements in world market prices for commodities and manufactures, interest rate differentials, and exchange rates. In estimating the significance of these variables, we examine some of the alternative hypotheses that have been advanced to explain the international transmission effects on the ASEAN-5 economies.

V. Modeling International Transmission Effects

In this section we extend the earlier estimates of the relationship between foreign and domestic income activity to include price-related effects and other influences on ASEAN-5 economic growth. The motivation for including these other effects is based on the previous section's review of the recent macroeconomic histories of these countries. Specifically, we examine the effects of the following variables:

- *Exchange rates* in the form of either the overall real effective exchange rate of the ASEAN-5 countries, bilateral real effective exchange rates with the major global regions, or the real yen/dollar exchange rate;
- *International prices* in the form of either the terms of trade of the ASEAN-5 countries or world market prices for primary commodities relative to those of manufactures;
- *Interest rates* in the form of interest rate differentials either between those in Japan and those in the United States, those for ASEAN-5 lending and those for Japanese borrowing, or those for ASEAN-5 lending and those for borrowing in the Eurodollar market;
- *Investment risks* on portfolio and direct investments in the form of either real exchange rate fluctuations or more generally imbalances in the balance of payments that reflect the risk of real exchange rate changes and/or capital controls.
- *World trade and capital inflows* in the form of world trade volumes, current account balances, the ratio of exports to GDP, and the importance of portfolio and direct investments to the economy.
- *Intra-ASEAN Linkages* in the form of the bilateral real effective exchange rate (REER) with other ASEAN-5 countries, the aggregate current account deficit of the ASEAN-5, and the region's reserve losses.

The empirical measurement of these effects is based on individual ASEAN-5 country estimates. In all cases, we maintain the earlier specification for the international transmission of incomes changes from the global, and extend that specification to include these other factors influencing economic growth.

5.1 Exchange Rate Effects

The motivation for including real effective exchange rates in the relationship for the global linkages of the ASEAN-5 countries is well developed. During the period of rapid economic expansion in the 1980s and until 1996 a high premium was placed on keeping stable exchange rates and moderate to low inflation (World Bank, 1993). In the subsequent crisis years, the exchange rate misalignments that emerged in the mid-1980s is believed to have created the

Table 5.1 Regression Results of Yen/US Dollar Exchange Rate Transmissions $\Delta y_t = \alpha_0 + \alpha_1(y - z)_{t-1} + \alpha_2\Delta Z_t + \alpha_3Z_{t-1} + \alpha_4\Delta R_t + \alpha_5R_{t-1} + v_t$										
ASEAN-5	$\ln(Y/Z)_{t-1}$	$\Delta \ln(Z)_t$	$\ln Z_{t-1}$	Summary Statistics						
				$\Delta \ln(R)_t$	$\ln R_{t-1}$	Const	R^2	dw	SE	dof
Indonesia <u>a/</u>	-0.11 (1.5)	0.48 (1.8)	0.07 (0.7)	0.06 (1.4)	0.06 (1.8)	-1.50	0.81	1.26	0.02	22
Malaysia	-0.11 (3.4)	0.76 (1.8)		0.01 (0.1)	0.13 (3.3)	-1.26	0.31	1.37	0.03	24
Philippines	-0.22 (2.6)	0.23 (0.5)			0.03 (1.1)	-1.36	0.15	0.86	0.04	25
Thailand <u>a/</u> , <u>b/</u>	-0.14 (3.0)	0.49 (1.9)	0.11 (1.2)	0.08 (2.1)	0.13 (3.9)	-2.43	0.77	1.31	0.02	21
Singapore <u>c/</u> , <u>d/</u>	-0.05 (0.9)	0.42 (1.5)	0.03 (0.2)	0.04 (1.0)	0.07 (1.8)	-0.88	0.63	1.27	0.02	18
Notations (lower-case letters denote logarithms of upper-case letters): Y = Domestic GDP Z = Foreign GDP R = Real effective exchange rate <u>a/</u> Includes a binary variable for 1998 (1 in 1998; 0 otherwise). <u>b/</u> Includes a binary variable for 1979 (1 in 1979; 0 otherwise). <u>c/</u> Includes a binary variable for 1985 (1 in 1985; 0 otherwise). <u>d/</u> Includes a binary variable for 1986 (1 in 1986; 0 otherwise). Notes: R^2 is the adjusted square of the multiple correlation coefficient; figures in parentheses below the coefficients are t-statistics.										

framework for the worsening of domestic economic fundamentals a decade later (Corsetti, Pesenti, and Roubini, 1998; Goldstein, 1998; Huh and Kasa, 1997; Makin, 1997; Noland *et al.*, 1998). In analyzing these effects, past research has usually relied on measures of REER changes in the Southeast Asian economies with all their partner countries. In addition to this measure, we have also tested the bilateral real effective exchange rates of each ASEAN-5 country with the major global regions of Japan, other Northeast Asian countries, the United States, the European Union and other ASEAN-5 countries.

The alternative hypothesis is that the dollar-pegged Southeast Asian economies have been mainly influenced by yen-dollar exchange rate movements. Kwan (1998) has shown that aggregate output of these countries has been closely linked to movements in the yen/dollar exchange rate. His results are based on estimates of the relationship between aggregate output growth of the Asian economies and the US gross national product (GNP) growth rate and percentage changes in the yen/dollar exchange rate. Output in the Asian economies was found to be positively related to the yen/dollar exchange rate: when the yen weakened, output growth in the dollar-pegged Asian economies slowed; when the yen strengthened, output growth accelerated.

We found the real yen/dollar exchange rate to be significant in explaining real GDP of the ASEAN-5 countries (Tables 5.1 and 5.2). On average, the short-term elasticity of income with respect to the real yen/dollar exchange rate is equal to 0.05, while the average long-term elasticity is 0.81. The short-term elasticities vary from 0.01 (Malaysia) to 0.08 (Thailand), while

the long-term elasticities vary from 0.13 (Philippines) to 1.33 (Singapore). All the coefficients have the expected positive sign suggesting that output in the ASEAN-5 economies is positively related to the yen/dollar exchange rate. The explanation for these findings is that when the yen has risen against the dollar, the export competitiveness of the dollar-pegged Asian economies has improved in the Japanese market and production costs have become more attractive to Japanese

Table 5.2			
Foreign Income and Exchange Rate Elasticities			
ASEAN-5		Foreign Income	Real Yen/Dollar Exchange Rate
Indonesia	Short-term	0.48	0.06
	Long-term	1.67	0.57
Malaysia	Short-term	0.76	0.01
	Long-term	1.00	1.15
Philippines	Short-term	0.23	0.03 (t-1)
	Long-term	1.00	0.13
Thailand	Short-term	0.49	0.08
	Long-term	1.80	0.90
Singapore	Short-term	0.42	0.04
	Long-term	1.56	1.33
Note: The elasticity measures the percentage change in real GDP of each ASEAN-5 country brought about by a 1 percent change in either foreign income or real yen/dollar exchange rate.			

investors. Alternatively, when the yen has weakened (for example, as it did between mid-1995 and mid-1997) Japanese export demand and FDI outflows have contracted and economic growth in the Southeast Asian economies has fallen.

The REER of the ASEAN-5 countries was statistically significant in explaining income changes of Indonesia, Malaysia and the Philippines. However, only in the case of Malaysia was the REER found to be significant in the long run. These findings are not surprising since reduced form estimates that relate real GDP of countries to their REER are often unable to capture the transmission effects of this variable through the demand for exports and imports and direct and portfolio investments. Instead it is usually necessary to estimate structural equations relating each of the national income components (for example, export demand) to the REER and then to estimate the individual effects on aggregate income.

5.2 International Price and Trade Volume Effects

In addition to real exchange rate changes, movements in world market prices for traded commodities and manufactures have impacted on the foreign demand for ASEAN-5 exports and the domestic demand for imports. Moreover, international prices have had an indirect effect on ASEAN-5 growth through their impact on export-oriented FDI activities. The importance of foreign firms in the export sector is well-documented (Chen, 1994; Dahman and Westphal, 1983). There is also ample evidence that export-orientation is one of the most important determinants of FDI flows (see, for example, Singh and Jun, 1995 and references therein). Moreover, the terms-of-trade shocks that hit Southeast Asia in 1997 had major repercussions on corporate earnings expectations. Stock markets in those countries contracted sharply, particularly in Thailand, Malaysia and the Philippines, and both foreign and domestic investors began to move funds offshore (Noland *et al.*, 1998).

Table 5.3**Regression Results of ASEAN-5 GDP Relationships to Foreign Income, International Financial Indicators and World Trade**

$$\Delta y_t = \alpha_0 + \alpha_1(y - Z)_{t-1} + \alpha_2\Delta Z_t + \alpha_3Z_{t-1} + \alpha_4\Delta R_t + \alpha_5R_{t-1} + \alpha_6\Delta W_t + \alpha_7W_{t-1} + \alpha_8\Delta Q_t + \alpha_9Q_{t-1} + \alpha_{10}\Delta d_t + \alpha_{11}d_{t-1} + \alpha_{12}\Delta k_t + \alpha_{13}k_{t-1} + v_t$$

ASEAN-5	$\ln(Y/Z)_{t-1}$	$\Delta \ln(Z)_t$	$\ln Z_{t-1}$	$\Delta \ln(R)_t$	$\ln R_{t-1}$	$\Delta \ln(W)_t$	$\ln W_{t-1}$	$\Delta \ln(Q)_t$	$\ln Q_{t-1}$	$\Delta \ln(D)_t$	$\ln D_{t-1}$	$\Delta \ln(K)_t$	$\ln K_{t-1}$	Const	R ²	dw	SE	dof
Indonesia	-0.32 (4.9)	0.38 (1.6)		-0.08 <u>a</u> / (2.5)		0.22 (4.6)	0.24 (4.8)	0.04 (8.9)	0.51 (7.6)			-0.01 <u>b</u> / (0.9)	-0.05 <u>b</u> / (6.1)	-5.14	0.97	2.61	0.01	10
Malaysia <u>c</u> / <u>d</u> /	-0.09 (1.2)	0.21 (0.7)		-0.02 <u>e</u> / (0.5)	-0.03 <u>e</u> / (0.9)	0.11 (2.5)	0.01 (0.2)	0.03 (4.9)	0.09 (1.5)			-0.01 <u>f</u> / (0.2)	-0.01 <u>f</u> / (0.1)	-0.78	0.85	2.24	0.02	15
Philippines	-0.30 (1.4)	0.79 (0.6)		-0.13 (1.2)		0.09 (0.6)		0.02 (2.5)	0.30 (2.6)	-0.04 (1.5)	-0.09 (3.9)	-0.09 (2.3)	-0.13 (4.4)	-3.37	0.79	2.99	0.02	7
Thailand	-0.11 (1.8)		0.21 (1.8)		0.09 <u>g</u> / (3.4)		0.02 (0.4)	0.02 (3.6)					-0.03 <u>b</u> / (3.7)	-3.12	0.91	1.67	0.01	13
Singapore <u>c</u> /	-0.07 (1.7)		0.03 (0.3)		0.08 <u>g</u> / (2.4)	0.14 (3.2)		0.005 (1.5)						-1.03	0.86	2.5	0.01	12

Notations (lower-case letters denote logarithms of upper-case letters):

Y = Domestic GDP

Z = Foreign GDP

R = Real effective exchange rate

W = Global terms of trade

Q = World trade volume

D = Interest rate differential

K = Risk premium

a/ Bilateral REER with Japan, other Northeast Asia, USA, EU and other ASEAN-5 countries.

b/ Risk premium based on real Japanese yen/US dollar exchange rate.

c/ Includes a binary variable for 1985 (1 in 1985; 0 otherwise).

d/ Includes a binary variable for 1986 (1 in 1986; 0 otherwise).

e/ Bilateral REER with USA.

f/ Risk premium based on REER of domestic currency.

g/ Japan-USA REER.

h/ Risk premium based on interest rate differential between Japanese yen and US dollar.

Notes: R² is the adjusted square of the multiple correlation coefficient; figures in parentheses below the coefficients are t-statistics.

We initially attempted to use two alternative measures of relative prices: the terms of trade for each economy, and world market prices for primary commodities relative to those of manufactures. Data for the terms of trade for most ASEAN-5 countries, however, are not available for the more recent years and these series were therefore not included in the final estimates. The alternative series on world commodity prices is more readily available.

To approximate a terms of trade measure for individual countries, we derived a global terms of trade estimate based on the ratio of the index of commodity prices to that of prices for manufactures. Commodity exports of the ASEAN-5 encompass a fairly broad range of products such as rubber, palm oil, tin, sugar, coconut oil, maize, and other agricultural and mineral commodities. We used the IMF's broad-based price series for primary commodities, which is an index covering 31 agricultural, mineral and metal commodities. For manufactures, we used the World Bank's Manufactured Unit Value (MUV) index, which is a composite index of prices for manufactured exports from the five major (G-5) industrial countries (France, Germany, Japan, the United Kingdom, and the United States) to low- and middle-income economies, valued in U.S. dollars. The MUV index covers products in Standard International Trade Classification (SITC) groups 5–8 and is constructed using trade-weighted unit value indexes for each country.

Table 5.4 Foreign Income, Financial Indicator and World Trade Elasticities							
ASEAN-5		Foreign Income	REER	Terms of Trade	World Trade Volume	Interest Rate Differential	Risk Premium
Indonesia	Short-term	0.38	-0.08 <u>a/</u>	0.22	0.04		-0.01 <u>b/</u>
	Long-term	1.00		0.73	1.60		-0.16
Malaysia	Short-term	0.21	-0.02 <u>c/</u>	0.11	0.03		-0.01 <u>d/</u>
	Long-term	1.00	-0.35	0.07	1.03		-0.02
Philippines	Short-term	0.79	-0.13 <u>a/</u>	0.11	0.02	-0.04 <u>f/</u>	-0.09 <u>b/</u>
	Long-term	1.00		0.31	1.01	-0.31	-0.45
Thailand	Short-term	0.21	0.09(t-1) <u>e/</u>	0.02(t-1)	0.02		-0.03(t-1) <u>b/</u>
	Long-term	2.91	0.82	0.20			-0.30
Singapore	Short-term	0.03(t-1)	0.08(t-1) <u>e/</u>	0.14	0.01		
	Long-term	1.36	1.00				
<u>a/</u> Bilateral REER with Japan, other Northeast Asia, USA, EU and other ASEAN-5 countries. <u>b/</u> Risk premium based on real Japanese yen/US dollar exchange rate. <u>c/</u> Bilateral REER with USA. <u>d/</u> Risk premium based on REER of domestic currency. <u>e/</u> Japan-USA REER. <u>f/</u> Risk premium based on interest rate differential between Japanese yen and US dollar.							
Note: The elasticity measures the percentage change in real GDP of each ASEAN-5 country brought about by a 1 percent change in either foreign income, the REER, the terms of trade, world trade volume, interest rate differentials or risk premium.							

As expected, world trade volumes and world commodity market prices relative to those of manufactures are significant in explaining changes in the ASEAN-5 countries' real GDP (Tables 5.3 and 5.4). The average of the estimated world trade volume elasticities equals only 0.02 in the short run but increases to 1.2 in the long run. This pattern is consistent among the ASEAN-5 countries: the short-term elasticity is low for all countries but the magnitude of all elasticities increases significantly in the long run, which suggests that adjustments take time but have an important influence on GDP. In the case of the global terms of trade, the average elasticity is generally higher in the short-run than that of world trade. It averages 0.12 for all ASEAN-5

countries, but it is considerably smaller in the long-run (0.33), compared with the average trade volume elasticity (1.2). These findings suggest that price transmissions occur more quickly than trade volume effects, but that changes in trade volumes tend to have a relatively larger impact on ASEAN-5 GDP than do price movements.

5.3 Differential Interest Rate Effects

Interest rate differentials affect movements in equity and debt securities on capital markets more than they do FDI movements, and therefore are likely to influence portfolio investments in the ASEAN-5 countries. In addition, it is generally acknowledged that the interest rate differential resulting from the long-term upward movement in the nominal dollar value of the yen drove nominal interest rates on yen-denominated assets below those prevailing on dollar-denominated assets. That change led banks in East Asia to undertake foreign currency indebtedness by accepting cheap yen deposits without covering their foreign exchange risk (McKinnon, 1998; Krugman, 1998). Financial intermediaries that over-borrowed and accumulated large short-term debt did not consider the risk associated with exchange rate changes, at least in their immediate future.

To measure the effect that these interest rate disparities have had on the ASEAN-5 economies, we used four alternative measures: (a) the ratio of the Japanese yen LIBOR three-month rate to the US dollar LIBOR rate, (b) the ratio of the Japanese yen lending rate to the US dollar LIBOR rate, (c) ratio of the nominal lending rates in each ASEAN-5 country to the Japanese yen LIBOR three-month rate, and (d) ratio of the nominal lending rates in each ASEAN-5 country to the US dollar LIBOR rate. In general the results did not support the use of this variable in explaining economic activity in the ASEAN-5 countries. The exception is the Philippines, where the ratio of the Japanese yen LIBOR three-month rate to the US dollar LIBOR rate was found to be statistically significant in explaining changes in real GDP (Tables 5.3 and 5.4). The reason for the general lack of significance of this variable in other countries may be the relatively short time period over which it influenced the Southeast Asian economies (mainly through portfolio investments, which did not become important to these countries until the early 1990s), compared with the fairly long time series (beginning in 1970) used for the equation estimates.

5.4 Investment Risk Effects

The main sources of risk for investors are interest rates, stock market returns, and contagion effects (Lopez-Mejia, 1999). Changes in interest rates can have large consequences on the macroeconomic performance and creditworthiness of developing countries, and more so through changes in portfolio investments than FDI (World Bank, 1997; Chuhan, Perez-Quiros, and Popper, 1996). If investments in emerging markets are used only to increase portfolio returns when investments in industrial countries are under-performing, then the investments will be very sensitive to changes in industrial countries' interest rates. In the case of the Asian financial crisis, however, it was the lack of confidence in the asset market that led to panic liquidation in all the Southeast Asian stock markets. The liquidation, in turn, instigated large movements of funds offshore that reversed capital flows and drained official reserves. The resulting downward

pressure on exchange rates was essentially domestically induced, although there were spillovers that gave rise to contagion and the pervasiveness of the Asian financial crisis (Sachs, 1997; Stiglitz, 1997).

We measured investment risk from the risk premium on foreign loans made by financial intermediaries in the ASEAN-5 countries. Based on the uncovered interest parity relationship, an investor will be indifferent between borrowing abroad or at home if the following relationship holds:

$$i_t = i_t^f + \Delta s_t^e + \gamma_t \quad (5.1)$$

where i is the domestic loan rate, i^f is the foreign loan rate, γ is the risk premium from the risk differential of the foreign and domestic loans, and the term $\Delta s_t^e = (S_{t+k}^e - S_t)/S_t$ is the expected change in the real exchange rate.¹ Since $\gamma_t = (i_t - i_t^f) - \Delta s_t^e$, the expectation of a devaluation of the domestic currency will increase the risk premium for foreign loans, while the expectation of an appreciation will lower the risk premium. If $\Delta \gamma_t > 0$ domestic intermediaries will reduce foreign borrowing, as well as domestic loans for asset purchases. Alternatively, if $\Delta \gamma_t < 0$ domestic intermediaries will increase foreign borrowing and domestic loans for asset purchases.

In practice we used the ratio of domestic to foreign loan rates and the ratio of current to past exchange rates to obtain non-negative numbers that can be used in the log-linear specification of the estimated relationships. In addition, we assumed that the formation of expectations for intermediaries in the dollar-pegged ASEAN-5 countries can take place in one of two ways. The first is from observed movements in the dollar-yen exchange rate; the second is through changes in the REER of the domestic currency. In the first case, an expected devaluation (appreciation) of the yen vis-à-vis the dollar would decrease (increase) the risk premium to ASEAN-5 intermediaries since it would lower (raise) their debt repayment costs to Japanese lenders. In the second case, an expected REER depreciation (appreciation) of the domestic currency would increase (decrease) the risk premium since it would raise (lower) the expected debt repayment cost of domestic intermediaries to foreign lenders.

A more accurate approach would be to use the expected change in the exchange rate as provided by a number of financial institutions (for an application, see MacDonald and Torrance, 1990). However, our need for fairly long time series prevented using this approach and we instead adopted the naïve rule that expectations are based on current observations. The resulting series nonetheless appears to provide a reasonable approximation of the risk premium during the period used to estimate the relationships. Using this measure we found the effect of risk premium on economic growth of the ASEAN-5 countries to generally be statistically significant. The average risk premium elasticity is -0.04 in the short run and it rises to -0.23 in the long run. The short run elasticity ranges from -0.01 (Indonesia and Malaysia) to -0.09 (Philippines), while the long run elasticity ranges from -0.02 (Malaysia) to -0.45 (Philippines).

¹ For details, see Hallwood and MacDonald (1994) and Obstfeld and Rogoff (1998). For applications to Southeast Asia, see McKibbin (1998) and McKibbin and Martin (1999).

5.5 Intra-ASEAN Linkages

Intra-regional trade in the ASEAN-5 represents about 20 percent of total trade (exports plus imports). In the traditional mechanism of international transmissions of exchange rate shocks, the competitive devaluation of one country has the effect of *beggar-thy-neighbor* relative to that of another country through its effects on cost-competitiveness. For example, when Thailand floated the baht, Malaysia and Indonesia were suddenly at a competitive disadvantage in their common export markets. The direct effect of these competitive devaluations on bilateral trade is a negative welfare impact on the economies of trading partners based on the deterioration of their export revenues. Beyond these traditional channels, the evidence for the ASEAN-5 points to strong common factors that underlie the spread of the Crisis after the Thai baht was floated in July 1997. To the extent that portfolio investors reacted to the increased risk of contagion with those countries in geographic proximity, there could also be close ties from direct trade or competition in extra-regional markets.

To test the impact of vulnerability indicators of intra-ASEAN-5 on individual member countries we included in our estimated equation (a) the bilateral real effective exchange rate (REER) with other ASEAN-5 countries and (b) the aggregate current account deficit of the ASEAN-5. The bilateral REER is an indicator of the expected growth of exports and imports both within the region and with external markets in which the ASEAN-5 countries compete, while the current account deficit is an indicator of the expected build-up in external liabilities. The estimates did not yield statistically significant coefficients for either variable in its short-term or long-term impact form. We also tested regional variables suggested by Early Warning System models used in the IMF (Borensztein, Berg, Milesi-Ferretti, and Pattillo, 1999), which included reserve losses for the ASEAN-5 as a whole. None of the estimated coefficients were found to be statistically significant.

These results are not surprising since the estimates are based on reduced form models that attempt to explain both fundamentals and spillovers not associated with direct or indirect product or financial market linkages of the ASEAN-5 countries. It is likely that a more disaggregated approach based on structural equations would yield better explanations of these intra-ASEAN-5 linkages.

5.6 Balance of Payments Effects

A widely-used approach to identify external sector effects on economies is the use of balance of payments and other indicators in place of the price-related variables discussed above (Lopez-Mejia, 1999, and references therein). To test the usefulness of this approach we adopted the indicators used by Little, Cooper, Corden and Rajapatirana (1993). With some minor adaptations of their external-sector-related indicators to ensure readily available time-series data, our indicators consist of the following variables:

- Foreign market GDP;
- Exports of goods and services as a percent of domestic GDP;
- Global terms of trade, as defined in Section 5.2 above;

- Volume of world trade;
- FDI inflows as a percentage of domestic GDP.

The results generally support the use of these indicators in explaining income changes in the ASEAN-5 countries (Tables 5.5 and 5.6). The limitation of this approach, however, is the relatively long delay in the publication of information for the selected indicators compared with the more up-to-date information available for exchange rates, international prices and interest rates. These delays are important when data are used either to explain recent developments or generate short-term forecasts. Nevertheless, the robustness of the estimates makes the approach useful in explaining movements in ASEAN-5 economic activity. Both exports and FDI changes were found to be statistically significant in explaining real GDP changes. The export/GDP elasticities of the ASEAN-5 countries average 0.04 in the short run and increase to 0.6 in the long run. Similarly, the short-term FDI/GDP elasticities average 0.03 in the short run and then increase to 0.23 in the long run. Only in the case of the Philippines were these variables not found to be statistically significant. Instead movements in the global terms of trade and world trade volumes were important in explaining GDP changes of that country.

5.7 Measuring the Impact of Balance of Payments Policies

Economic policies in the ASEAN-5 countries are also likely to significantly affect the magnitude of international transmissions. Variations in trade policies appear to have played an important role in the macroeconomic histories of Southeast Asia and other developing regions (Little, Cooper, Corden and Rajapatirana, 1993). Lucas's (1993) investigation of Southeast Asian countries also provides evidence of the relative importance of outward-oriented policies. Although trade policies appear to be the main instruments used for balance of payments policies, financial policies are also likely to influence capital movements during tightening or liberalization episodes. Variations in restrictions are clearly demarcated by regime changes, such as the elimination of quantitative restrictions (QRs), and are usually included as part of a policy package. It is therefore fairly straightforward to quantify the impact of trade or financial policy episodes (see, for example, Dollar, 1992; Easterly, 1993; Edwards, 1993; Harrison, 1996; Fischer, 1993; Sachs and Warner, 1995).

Similar econometric techniques can be used to examine whether exchange rate policy differences among ASEAN-5 countries explain divergent economic growth rates among ASEAN-5 countries despite other similarities. These policy differences can be used to examine whether countries that experienced the sharpest variations in growth in the 1980s and 1990s are those with adopted exchange controls (for example, as measured by indicators of exchange rate regimes) and with weak institutions of exchange rate management (proxied, for example, by indicators of the quality of governmental institutions, regulatory controls, and capital controls in the balance of payments). Nonetheless, since balance of payments policies are likely to form part of a broader policy package, care needs to be taken in the specification of policy episodes to avoid erroneously attributing to them income changes that were brought about by concurrent monetary or fiscal policies.

It is also likely that as countries become increasingly open and the markets for goods, capital and technology become liberalized, they will experience a tendency towards income convergence. However, the evidence points to a slow convergence between developing and industrialized countries (for a review, see Obstfeld and Rogoff, 1998, Ch. 7). Since our focus is on short-term effects from global linkages, we have not explicitly addressed convergence conditions in our analysis of global linkages. Nevertheless, our estimates identify both short and long-term components and implicitly offer some evidence on the convergence issue, albeit for a relatively shorter time period than the 100-plus year sample used by Maddison (1982) and others.

Table 5.5**Regression Results of ASEAN-5 GDP Relationships to Balance of Payments and Other External Sector Indicators**

$$\Delta y_t = \alpha_0 + \alpha_1(y - z)_{t-1} + \alpha_2\Delta Z_t + \alpha_3Z_{t-1} + \alpha_4\Delta X_t + \alpha_5X_{t-1} + \alpha_6\Delta f_t + \alpha_7f_{t-1} + \alpha_8\Delta W_t + \alpha_9W_{t-1} + \alpha_{10}\Delta Q_t + \alpha_{11}Q_{t-1} + v_t$$

ASEAN-5	$\ln(Y/Z)_{t-1}$	$\Delta \ln(Z)_t$	$\ln Z_{t-1}$	$\Delta \ln(X)_t$	$\ln X_{t-1}$	$\Delta \ln(F)_t$	$\ln F_{t-1}$	$\Delta \ln(W)_t$	$\ln W_{t-1}$	$\Delta \ln(Q)_t$	$\ln Q_{t-1}$	Const	R ²	dw	SE	dof
Indonesia	-0.16 (2.0)	0.17 (0.5)	0.16 (1.8)	0.06 (8.3)	0.04 (1.3)	0.01 (1.3)	0.01 (1.8)					-2.49	0.80	1.69	0.02	21
Malaysia	-0.08 (1.2)	1.51 (4.6)	0.04 (0.4)	0.01 (1.7)	0.05 (0.9)	0.05 (3.0)	0.04 (3.4)					-1.15	0.73	2.05	0.02	21
Philippines <i>a/</i> , <i>b/</i>	-0.06 (1.5)	0.93 (4.2)							0.08 (2.8)	0.01 (2.7)	0.03 (1.5)	-0.86	0.87	1.58	0.01	19
Thailand <i>d/</i>	-0.19 (4.8)	0.86 (4.9)	0.10 (1.6)	0.05 (13.3)	0.20 (5.7)							-2.66	0.90	1.93	0.01	21
Singapore <i>b/</i> , <i>e/</i>	-0.06 (2.4)	0.23 (1.6)	0.11 (2.3)		0.03 (2.0)	0.02 (3.3)	0.01 (0.9)	0.09 (3.8)		0.01 (0.6)		-1.56	0.93	2.72	0.01	16

Notations (lower-case letters denote logarithms of upper-case letters):

Y = Domestic GDP

Z = Foreign GDP

X = Exports of goods and services relative to GDP

F = FDI inflows relative to GDP

W = Global terms of trade

Q = World trade volume

a/ Includes a binary variable for 1984 (1 in 1984; 0 otherwise).

b/ Includes a binary variable for 1985 (1 in 1985; 0 otherwise).

c/ Current period.

d/ Includes a binary variable for 1997 (1 in 1997; 0 otherwise).

e/ Includes a binary variable for 1986 (1 in 1986; 0 otherwise).

Notes: R² is the adjusted square of the multiple correlation coefficient; figures in parentheses below the coefficients are t-statistics.

Table 5.6							
Balance of Payments and Other Indicator Elasticities							
ASEAN-5		Foreign Income	Exports	FDI	Global Terms of Trade	World Trade Volume	
Indonesia	Short-term	0.16	0.06	0.01			
	Long-term	2.01	0.25	0.06			
Malaysia	Short-term	1.51	0.01	0.05			
	Long-term	1.49	0.60	0.53			
Philippines	Short-term	0.93			0.08(t-1)	0.01	
	Long-term	1.00			0.13	0.05	
Thailand	Short-term	0.86	0.05				
	Long-term	1.56	1.06				
Singapore	Short-term	0.23	0.03(t-1)	0.02	0.09	0.01	
	Long-term	2.77	0.44	0.09			
Note: The elasticity measures the percentage change in real GDP of each ASEAN-5 country brought about by a 1 percent change in either the foreign income, exports, FDI, the terms of trade or world trade volume.							

VI. Conclusions

This study has examined the global linkages of the ASEAN-5 countries consisting of Indonesia, Malaysia, Philippines, Singapore and Thailand. External influences on these countries are largely driven by developments in Japan, other Northeast Asian countries, the United States, the European Union, and within the ASEAN region. Our estimates of the international transmission of income and other changes have separated the long run or equilibrium relationships between domestic income and foreign income, price and other variables from the short-run or dynamic disequilibrium components of those relationships. While the systematic determinants of the ASEAN-5 countries' global linkages are fairly stable and robust, our focus in this study has been on the short-term dynamics underlying the transmission of income, price and other factors in the global economy.

The findings confirm expectations of strong economic linkages between selected ASEAN member countries and the major regions of the global economy. The transmission of foreign income changes has been found to have important consequences for the ASEAN-5 countries in both the short run and long run. Estimates of the international transmission of income changes based on aggregate data from all the regions show a similar pattern as those for individual regional estimates. These aggregated relationships were therefore used to estimate the international transmission of exchange rates and other influences on the ASEAN-5 countries.

In addition to foreign income effects, we have examined the effects of the following variables on ASEAN-5 economic activity: (a) *exchange rates* in the form of either the overall real effective exchange rate of the ASEAN-5 countries, bilateral real effective exchange rates with the major global regions, or the real yen/dollar exchange rate; (b) *international prices* in the form of either the terms of trade of the ASEAN-5 or world market prices for primary commodities relative to those of manufactures; (c) *interest rates* in the form of interest rate differentials either between those in Japan and those in the United States, those for ASEAN-5 lending and those for Japanese borrowing, or those for ASEAN-5 lending and those for borrowing in the Eurodollar market; (d) *investment risks* on portfolio and direct investments in the form of either real exchange rate fluctuations or more generally imbalances in the balance of payments that reflect the risk of real exchange rate changes and/or capital controls; (e) *world trade and capital inflows* in the form of world trade volumes, current account balances, the ratio of exports to GDP, and the importance of portfolio and direct investments to the economy; and (f) *intra-ASEAN linkages* in the form of the bilateral real effective exchange rate (REER) with other ASEAN-5 countries, the aggregate current account deficit of the ASEAN-5, and the region's reserve losses. In all cases, empirical measurement has been based on individual ASEAN-5 country estimates.

We have found real yen/dollar exchange rate variations to be significant in explaining real GDP changes in the ASEAN-5 countries. On average, the short-term elasticity of income with respect to the real yen/dollar exchange rate is equal to 0.05, while the average long-term elasticity is 0.8. All the coefficients have the expected positive sign suggesting that output in the ASEAN-5 economies is positively related to the yen/dollar exchange rate. The explanation for these findings is that when the yen has risen against the dollar, the export competitiveness of the dollar-pegged Asian economies has improved in the Japanese market and production costs have become more attractive to Japanese investors. Alternatively, when the yen has weakened (for example, as it did between mid-1995 and mid-1997) Japanese export demand and FDI outflows have contracted and economic growth in the Southeast Asian economies has fallen.

The REER of the ASEAN-5 countries was found to be statistically significant in explaining income changes of Indonesia, Malaysia and the Philippines. However, only in the case of Malaysia was the REER significant in the long run. These findings are not surprising since reduced form estimates that related real GDP of countries to their REER are often unable to capture the transmission effects of this variable through the demand for exports and imports and direct and portfolio investments. Instead it is usually necessary to estimate structural equations relating each of the national income components (for example, export demand) to the REER and then estimating the individual effects on aggregate income.

In addition to real exchange rate changes, movements in world market prices for traded commodities and manufactures have impacted on the foreign demand for ASEAN-5 exports and domestic demand for imports, as well as export-oriented FDI activities. As expected, world trade volumes and world commodity market prices relative to those of manufactures have been found to be significant in explaining changes in the ASEAN-5 countries' real GDP. The average of the estimated world trade volume elasticities equals only 0.02 in the short run and increases to 1.2 in the long run. This pattern is consistent among the ASEAN-5 countries: the short-term elasticity is low for all countries but the magnitude of all elasticities increases significantly in the long run, which suggests that adjustments take time but have an important influence on GDP. In the case of the global terms of trade, the average elasticity is generally higher in the short-run than that of world trade. These findings suggest that price transmissions occur more quickly than trade volume effects, but that movements in trade volumes tend to have a relatively larger impact on ASEAN-5 GDP than do price variations.

Interest rate differentials tend to affect movements in equity and debt securities on capital markets more than they do FDI movements, and therefore are likely to have had a large influence on portfolio investments. However, in the ASEAN-5 the results did not support the use of this variable in explaining economic activity. The exception is the Philippines, where the ratio of the Japanese yen LIBOR three-month rate to the US dollar LIBOR rate was found to be statistically significant in explaining changes in real GDP. The reason for the general lack of significance of this variable in other countries may be the relatively short time period over which it influenced the Southeast Asian economies, compared with the fairly long time series (beginning in 1970) used for the equation estimates.

Investment risk has been measured from the risk premium on foreign loans made by financial intermediaries in the ASEAN-5 countries using the uncovered interest parity relationship. Using this measure we found the effect of risk premium on economic growth of the ASEAN-5 countries to be statistically significant in most cases. The average risk premium elasticity is -0.04 in the short run and it rises to -0.23 in the long run.

We also examined the global linkages of ASEAN-5 based on alternative set of data with balance of payments and world trade indicators. The results generally support the use of these indicators in explaining income changes in the ASEAN-5 countries. The limitation of this approach, however, is the relatively long delay in the publication of information for the selected indicators compared with the more up-to-date information available for exchange rates, international prices and interest rates. These delays are important when data are being used either to explain recent developments or to generate short-term forecasts. Nevertheless, the robustness of the estimates makes the approach useful in explaining movements in ASEAN-5 economic activity. Both exports and FDI changes were found to be significant in explaining real GDP changes. The export/GDP elasticities of the ASEAN-5 countries average 0.04 in the short run and then increase to 0.6 in the long run. Similarly, the short-term FDI/GDP elasticities average 0.03 in the short run and then increase to 0.23 in the long run. Only in the case of the Philippines were these variables not found to be statistically significant. Instead movements in the global terms of trade and world trade volumes were important in explaining GDP changes of that country.

Additional research on the global linkages of the ASEAN countries would benefit from extensions in two areas. The first is the measurement of the effects of economic policies. Balance of payments policies using trade policy instruments and capital controls have been found to play an important role in the macroeconomic histories of Southeast Asia and other developing regions. Financial policies are also likely to influence capital movements during tightening or liberalization episodes. Quantification of these policy effects would help to identify their effects on ASEAN economic activity. Similar econometric techniques could also be used to examine whether exchange rate policy differences among ASEAN countries explain divergent economic growth rates among these countries despite other similarities.

Another useful area of research would consider ASEAN global linkages based on estimates of the structural relationships in the economies of the member countries. It is likely that such an approach would yield more robust estimates of the international transmission mechanisms impacting on these countries than those based on reduced form equations.

Technical Appendix

A.1 Unit Root Tests

In modeling the global linkages of the ASEAN-5 economies, we are initially concerned with two questions: the first is whether the individual variables are stationary or non-stationary and therefore may require some linear transformation before estimating their relationship to one another; the second is whether the order of integration of the individual time series that are included in the empirical relationship is the same and therefore allows us to estimate their long-run equilibrium relationship and derive the short-term deviations from that relationship.

For series that tend to grow either positively or negatively over time, it is first necessary to examine whether or not the series are themselves stationary before proceeding to find the long-term equilibrium relationship of two or more economic variables. In practice, when only a one-period lag of the dependent variable is included in the regression, then a Dickey-Fuller (DF) test is performed to determine whether the series is stationary. When first difference terms are included in the regression, then an Augmented Dickey-Fuller (ADF) test is performed. The number of lagged first difference terms to include in the regression should be sufficient to remove any serial correlation in the residuals, in which case the DW statistic should approximate 2.¹

Initially the test is performed on the levels form of the regression. If the test fails to reject the test in levels then a first difference test regression should be performed. If the test fails to reject the test in levels but rejects the test in first differences, then the series is of integrated order one $I(1)$. If, on the other hand, the test fails to reject the test in levels and first differences but rejects the test in second differences, then the series is of integrated order two $I(2)$.

The results of the Augmented Dickey-Fuller test and the Durbin-Watson test are presented in Table 1. As expected, the tests all fail to establish stationarity of the log levels and indicate that all the log levels are integrated processes. For all the ASEAN-5 countries, the real GDP series are all of integrated order 2. For the three global regions, the real GDP series of Japan is also of integrated order 2, but those of the United States and the European Union are of integrated order 1. The properties of the series for the latter two global regions suggest that complications are likely to arise in estimates of the relationship between the real GDP time series of the ASEAN members and those of the United States and the European Union. In particular, when the series are integrated of different orders, then the two series cannot then be cointegrated. In such a case, it becomes difficult to describe the existence of an equilibrium, or stationary, relationship between, say, the transmission of changes in economic activity of the United States to

¹ A constant and trend variable should be included if the series exhibits a trend and non-zero mean in the descriptive statistics. Alternatively, if the series does not exhibit any trend but has a non-zero mean, only a constant should be included in the test regression. Finally, if the series appears to fluctuate around a zero mean, neither a constant nor a trend should be included in the test regression.

TABLE A.1
DESCRIPTIVE STATISTICS FOR REAL GDP OF ASEAN-5 AND GLOBAL
REGIONS
(Calculated for log levels of corresponding variables)

	Order of Integration	Augmented Dickey-Fuller Test Stat	Critical Value	Durbin- Watson Statistic
Indonesia	I(2)	-5.79	1%=-2.65	1.98
Malaysia	I(2)	-5.57	1%=-3.70	2.05
Philippines	I(2)	-4.91	1%=-3.70	1.84
Thailand	I(2)	-4.08	1%=-2.65	1.91
Singapore	I(2)	-5.62	1%=-2.65	1.97
ASEAN-5	I(2)	-3.36	1%=-2.66	2.00
Japan	I(2)	-6.32	1%=-2.65	1.64
United States	I(1)	-4.66	1%=-3.69	2.19
European Union	I(1)	-4.11	1%=-3.69	2.00
Japan, US and EU	I(1)	-4.58	1%=-3.70	1.63

Note 1: The sample period varies from 1971-73 to 1998.
Note 2: A negative Dickey-Fuller statistic that is larger (in absolute terms) than the critical value allows rejection of the hypothesis of a unit root and suggests that the series is stationary.

Indonesia, since each is individually non-stationary but is of a different integrated order than the other. In contrast, in the case of the transmission mechanism of real GDP changes in Japan to the ASEAN-5, there is likely to exist an equilibrium, or stationary, relationship since each series is individually non-stationary. In these cases, there may exist a linear combination of the real GDP series for each ASEAN country and Japan that has a lower order of integration than any one of them has individually. These results are examined further in the following section.

A.2 The ECM Relationship

Economic series that are related to the long-run adjustment processes of other variables have been designated to be cointegrated series by Granger and Weiss (1983) and Engle and Granger (1987). The theory of cointegration states that if two series, y and z , grow over time in such a way that the linear combination of these two variables, given by $d_t = y_t - \alpha z_t$, is stationary, and if α is unique, then y and z are said to be cointegrated. The series d_t measures the disequilibrium at period t when the long-run relationship between the two variables is $y_t = \alpha z_t$. The theory of cointegration states that movements in variables are related in a predictable way to the discrepancy between observed and equilibrium states. The sequence of this discrepancy tends to decay to its mean of zero.

Engle and Granger (1987) have demonstrated that a data-generating process of the form known as the “error-correction mechanism” (ECM) adjusts for any disequilibrium between variables that are cointegrated. The ECM specification thus provides the means by which the short-run observed behavior of variables is associated with their long-run equilibrium growth paths. Davidson *et al.* (1978) established a closely-related specification known as the “equilibrium-correcting mechanism” (also having the acronym ECM) that models both the short and long-run relationships between variables.

Rearranging the terms of a first-order stochastic difference equation yields the following ECM:

$$\Delta y_t = \alpha_0 + \alpha_1(y - z)_{t-1} + \alpha_2\Delta z_t + \alpha_3z_{t-1} + v_t \quad (\text{A.4})$$

where $-1 < \alpha_1 < 0$, $\alpha_2 > 0$ and $\alpha_3 > -1$, and where all variables are measured in logarithmic terms.

The second term, $\alpha_1(y - z)_{t-1}$, is the mechanism for adjusting any disequilibrium in the previous period. When the rate of growth of the dependent variable y_t falls below its steady-state path, the value of the ratio of variables in the second term decreases in the subsequent period. That decrease, combined with the negative coefficient of the term, has a positive influence on the growth rate of the dependent variable. Conversely, when the growth rate of the dependent variable increases above its steady-state path, the adjustment mechanism embodied in the second term generates downward pressure on the growth rate of the dependent variable until it reaches that of its steady-state path. The speed with which the system approaches its steady-state path depends on the proximity of the coefficient to minus one. If the coefficient is close to minus one, the system converges to its steady-state path quickly; if it is near to zero, the approach of the system to the steady-state path is slow. Since the variables are measured in logarithms, Δy and Δz can be interpreted as the rate of change of the variables. Thus the third term, $\alpha_2\Delta z_t$, expresses the steady-state growth in Y associated with Z . Finally, the fourth term, α_3z_{t-1} , shows that the steady-state response of the dependent variable Y to the variable Z is non-proportional when the coefficient has non-zero significance.

Open economies such as the ASEAN-5 have a long-term relationship with one or more series in the global economy after transient effects from all other series have disappeared. That part of the response of each ASEAN country's real GDP that never decays to zero is the steady-state response, while that part that decays to zero in the long run is the transient response. Examples in the global economy of relationships in which steady-state responses occur are those between the real GDP of a country and the real GDP in its major foreign markets. An example of a transient response is exchange rate movements, since if relative price changes were not transient, the disparity between prices of the home country and the foreign market would continuously widen. In that case, consumers would eventually switch entirely to the supplier with the lower priced products. Hence, it is important to distinguish the short-run adjustment component from the long-run equilibrium component in global linkages.

The equilibrium solution of equation (A.4) is a constant value if there is convergence. Since the solution is unrelated to time, the rate of change over time of the dependent variable Y (given by Δy_t) and the explanatory variable Z (given by Δz_t) are equal to zero. However, in dynamic equilibrium, equation (A.4) generates a steady-state response in which growth occurs at a constant rate, say g . For the dynamic specification of the relationship in (A.4), if g_1 is defined as the steady-state growth rate of the dependent variable Y , and g_2 corresponds to the steady-state growth rate of the explanatory variable Z , then, since lower-case letters denote the logarithms of variables, $g_1 = \Delta y$ and $g_2 = \Delta z$

in dynamic equilibrium. In equilibrium the systematic dynamics of equation (A.4) are expressed as:

$$g_1 = \alpha_0 + \alpha_1(y - z) + \alpha_2g_2 + \alpha_3z \quad (\text{A.5})$$

or, in terms of the original (anti-logarithmic) values of the variables:

$$Y = k_0 Z^\beta \quad (\text{A.6})$$

where $k_0 = \exp\{(-\alpha_0/\alpha_1) + [(\alpha_1 - \alpha_2\alpha_1 - \alpha_3)/\alpha_1^2]g_2\}$, and where $\beta = 1 - \alpha_3/\alpha_1$.

The dynamic solution of equation (A.6) therefore shows Y to be influenced by changes in the rate of growth of Z , as well as the long-run elasticity of Y with respect to Z . For example, were the rate of growth of the explanatory variable accelerate, say from g_2 to g'_2 , the value of the variable Y would increase. However, it is important to reiterate that the response to each explanatory variable can be either transient or steady-state. When theoretical considerations suggest that an explanatory variable generates a transient, rather than steady-state, response, it is appropriate to constrain its long-run effect to zero.

When consolidating the effects of income changes in several global regions on the ASEAN-5 economies, we can include the relationship between economic activity in each ASEAN-5 economy and economic activity in all the global regions. To simplify the presentation, we specify the relationship for two global regions. The ECM that includes economic activity in two geographic markets z_1 and z_2 is as follows

$$\Delta y_t = \alpha_0 + \alpha_1(y - z_1 - z_2)_{t-1} + \alpha_2\Delta z_{1,t} + \alpha_3\Delta z_{2,t} + \alpha_4z_{1,t-1} + \alpha_5z_{2,t-1} + v_t \quad (\text{A.7})$$

where $-1 < \alpha_1 < 0$; $\alpha_2, \alpha_3 > 0$ and $\alpha_4, \alpha_5 > -1$, and where all variables are measured in logarithmic terms. The extension to the five global regions used in this study is straightforward.

The effects of changes in the real effective exchange rate (REER), r , can be measured by extending the first-order stochastic difference equation. Transformation of an autoregressive distributed lag into an ECM with a 'differences' formulation of the relative price or exchange rate term nested in the levels form of the equation yields the equation:

$$\Delta y_t = \alpha_0 + \alpha_1(y - z)_{t-1} + \alpha_2\Delta z_t + \alpha_3z_{t-1} + \alpha_4\Delta r_t + \alpha_5r_{t-1} + v_t \quad (\text{A.8})$$

where $-1 < \alpha_1 < 0$, $\alpha_2 > 0$, $\alpha_3 > -1$, $\alpha_4 < 0$ and $\alpha_5 < 0$, and where all variables are measured in logarithmic terms.

Extensions of equation (A.8) to include the terms of trade, interest rate differentials, the risk premium, and other variables included in the relationship in Section V of this study are straightforward.

Statistical Appendix

Table A.1

Real GDP of ASEAN-5 Countries and Global Regions, in Constant US Dollar Prices, 1980-2000

(billions of 1998 US dollars)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
INDONESIA	37	40	39	41	43	45	47	50	52	57	62	68	73	78	84	91	98	103	89	85	87
MALAYSIA	23	24	26	28	30	29	30	31	34	37	41	44	48	52	57	62	67	72	67	68	69
PHILIPPINES	44	46	47	48	45	42	43	45	48	51	52	52	52	53	56	58	62	65	65	66	68
THAILAND	38	40	42	44	47	49	52	57	64	72	81	87	94	102	111	121	128	127	117	118	122
SINGAPORE	23	26	27	30	32	32	32	35	40	43	47	51	54	59	66	72	77	83	84	85	88
ASEAN-5	165	175	182	191	197	196	204	218	238	261	283	302	321	345	373	404	432	450	422	422	435
JAPAN	2298	2371	2444	2501	2599	2713	2792	2908	3088	3237	3401	3530	3566	3578	3600	3653	3838	3893	3783	3732	3745
USA	5202	5321	5207	5414	5793	6000	6185	6367	6610	6832	6916	6852	7038	7201	7450	7620	7883	8193	8511	8787	8977
EU	5725	5728	5774	5871	6011	6164	6338	6512	6783	7019	7234	7356	7435	7399	7622	7800	7942	8154	8380	8529	8761
JAPAN, USA, EU	13225	13420	13425	13786	14402	14877	15314	15787	16481	17088	17552	17738	18040	18177	18673	19073	19663	20240	20674	21048	21483

Source: Derived from IMF, *World Economic Outlook* (May, 1999).

Table A.2

ASEAN-5 Trade of Goods and Services, 1980-1997

(Billions of local currency units)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Exports of Goods and NFS																		
INDONESIA	13,849	16,177	15,103	19,847	22,999	21,867	21,486	30,837	36,493	45,764	55,852	68,452	83,050	88,231	101,332	119,593	137,533	174,871
MALAYSIA	31	30	32	36	43	43	40	51	61	75	88	105	114	136	174	209	230	261
PHILIPPINES	57	67	64	79	126	137	160	182	227	260	296	369	394	462	573	693	880	1,188
SINGAPORE	11	13	14	14	14	13	13	17	24	28	37	44	51	60	79	105	111	105
THAILAND	160	181	193	185	216	245	290	376	515	648	745	901	1,047	1,199	1,408	1,749	1,809	2,270
ASEAN-5	14,108	16,469	15,406	20,161	23,399	22,305	21,989	31,462	37,320	46,776	57,019	69,871	84,655	90,087	103,566	122,348	140,562	178,696
Imports of Goods and NFS																		
INDONESIA	10,080	14,119	15,186	19,626	19,845	20,142	22,645	28,825	32,830	41,564	54,827	67,453	76,438	78,383	96,953	125,657	140,812	176,600
MALAYSIA	29	34	37	40	42	39	36	40	52	69	86	110	112	136	177	217	227	257
PHILIPPINES	69	77	83	104	132	125	136	179	215	280	359	407	460	587	679	842	1,071	1,439
SINGAPORE	12	14	14	14	14	13	13	17	23	27	36	41	48	57	72	95	102	97
THAILAND	201	229	207	251	259	274	267	368	537	696	909	1,065	1,160	1,316	1,565	2,008	2,076	2,238
ASEAN-5	10,392	14,472	15,527	20,035	20,291	20,593	23,097	29,428	33,657	42,636	56,217	69,076	78,218	80,478	99,447	128,820	144,287	180,631
Total Imports and Exports																		
INDONESIA	23,929	30,296	30,289	39,473	42,844	42,009	44,131	59,662	69,323	87,328	110,679	135,905	159,488	166,614	198,285	245,250	278,345	351,471
MALAYSIA	60	64	69	76	85	81	76	90	113	143	174	214	226	271	351	426	457	519
PHILIPPINES	127	144	147	182	258	263	297	361	442	540	655	776	854	1,049	1,252	1,535	1,950	2,627
SINGAPORE	23	27	28	28	29	26	25	33	47	55	73	84	99	117	151	200	212	202
THAILAND	361	410	400	436	475	519	557	744	1,052	1,345	1,655	1,967	2,207	2,515	2,973	3,757	3,885	4,508
ASEAN-5	24,500	30,941	30,933	40,196	43,690	42,897	45,086	60,890	70,977	89,412	113,236	138,947	162,873	170,566	203,012	251,168	284,849	359,327
Trade / GDP * 100																		
INDONESIA	44	49	46	48	45	41	41	45	46	49	52	54	56	51	52	54	52	56
MALAYSIA	113	111	110	109	107	105	106	113	124	140	151	162	152	164	184	195	183	188
PHILIPPINES	52	51	46	49	49	46	49	53	55	58	61	62	63	71	74	81	90	108
SINGAPORE	92	92	84	77	71	66	64	76	91	94	108	112	122	124	140	169	164	143
THAILAND	54	54	48	47	48	49	49	57	67	72	76	78	78	79	82	90	84	93
ASEAN-5	44	50	46	48	45	41	41	46	47	49	53	55	57	51	52	54	53	57

Source: Derived from IMF, *International Financial Statistics* (June 1999).

Table A.3																			
Capital Inflows by Type, 1980-1997																			
(Millions of US dollars and percentages)																			
		1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
VALUE OF INFLOWS:																			
Indonesia	Mil. US\$	n.a.	1,861	5,622	6,054	3,457	1,782	4,177	3,481	2,217	2,918	4,495	5,697	6,129	5,988	4,448	10,862	11,447	-429
Foreign direct investment	Mil. US\$	n.a.	133	225	292	222	310	258	385	576	682	1,093	1,482	1,777	2,004	2,109	4,346	6,194	4,673
Portfolio investment	Mil. US\$	n.a.	47	315	368	-10	-35	268	-88	-98	-173	-93	-12	-88	1,805	3,877	4,100	5,005	-2,632
Other investment liabilities	Mil. US\$	n.a.	1,681	5,082	5,394	3,245	1,507	3,651	3,184	1,739	2,409	3,495	4,227	4,440	2,179	-1,538	2,416	248	-2,470
Malaysia	Mil. US\$	1,532	2,892	3,879	5,326	2,765	1,774	1,050	-989	-918	1,303	1,989	4,664	7,244	11,738	784	8,422	9,418	3,732
Foreign direct investment	Mil. US\$	934	1,265	1,397	1,261	797	695	489	423	719	1,668	2,332	3,998	5,183	5,006	4,342	4,178	5,078	5,106
Portfolio investment	Mil. US\$	-11	1,131	601	668	1,108	1,942	30	140	-448	-107	-255	170	-1,122	-709	-1,649	-436	-268	-248
Other investment liabilities	Mil. US\$	609	496	1,881	3,398	859	-862	531	-1,551	-1,189	-258	-89	496	3,183	7,441	-1,909	4,679	4,607	-1,126
Philippines	Mil. US\$	3,074	2,733	3,202	-497	695	340	146	320	572	1,368	2,057	2,942	3,323	4,590	6,054	7,137	13,013	6,218
Foreign direct investment	Mil. US\$	-106	172	16	105	9	12	127	307	936	563	530	544	228	1,238	1,591	1,478	1,517	1,222
Portfolio investment	Mil. US\$	5	5	1	7	11	17	13	21	51	294	-50	125	155	897	901	2,619	5,126	600
Other investment liabilities	Mil. US\$	3,175	2,556	3,185	-609	675	311	6	-8	-415	511	1,577	2,273	2,940	2,455	3,562	3,040	6,370	4,396
Singapore	Mil. US\$	2,542	4,991	2,535	3,496	4,905	3,532	3,221	3,015	4,022	10,675	7,812	1,706	8,703	15,877	14,392	20,280	23,232	46,062
Foreign direct investment	Mil. US\$	1,236	1,660	1,602	1,134	1,302	1,047	1,710	2,836	3,655	2,887	5,575	4,887	2,204	4,686	8,368	7,386	7,444	8,631
Portfolio investment	Mil. US\$	134	145	78	111	10	521	-261	320	36	375	573	-242	1,398	2,867	114	410	1,672	938
Other investment liabilities	Mil. US\$	1,173	3,186	856	2,251	3,593	1,964	1,772	-141	332	7,413	1,664	-2,940	5,101	8,324	5,911	12,484	14,116	36,492
Thailand	Mil. US\$	2,068	2,523	1,379	2,076	2,647	1,781	20	1,091	3,595	6,962	9,402	11,575	9,517	13,998	13,691	25,534	17,797	-13,637
Foreign direct investment	Mil. US\$	190	291	191	350	401	163	263	352	1,105	1,775	2,444	2,014	2,113	1,804	1,366	2,068	2,336	3,746
Portfolio investment	Mil. US\$	96	44	68	108	155	895	-29	346	530	1,486	-38	-81	924	5,455	2,486	4,083	3,585	4,798
Other investment liabilities	Mil. US\$	1,782	2,188	1,120	1,618	2,091	722	-213	393	1,960	3,700	6,996	9,642	6,479	6,739	9,839	19,383	11,876	-22,181
ASEAN-5	Mil. US\$	n.a.	14,999	16,618	16,455	14,468	9,210	8,614	6,918	9,488	23,226	25,754	26,583	34,917	52,192	39,370	72,234	74,907	41,945
Foreign direct investment	Mil. US\$	n.a.	3,520	3,431	3,141	2,731	2,227	2,847	4,303	6,992	7,575	11,974	12,926	11,506	14,738	17,776	19,456	22,569	23,378
Portfolio investment	Mil. US\$	n.a.	1,372	1,063	1,262	1,274	3,340	20	738	71	1,875	137	-40	1,267	10,316	5,729	10,776	15,120	3,456
Other investment liabilities	Mil. US\$	n.a.	10,107	12,124	12,052	10,463	3,643	5,747	1,877	2,426	13,776	13,644	13,698	22,144	27,138	15,865	42,002	37,217	15,111

(cont'd)

Table A.3 (cont'd)

Capital Inflows by Type, 1980-1997

(Millions of US dollars and percentages)

		1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
PERCENTAGE COMPOSITION:																			
Indonesia	percent	n.a.	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Foreign direct investment	percent	n.a.	7	4	5	6	17	6	11	26	23	24	26	29	33	47	40	54	-1,089
Portfolio investment	percent	n.a.	3	6	6	0	-2	6	-3	-4	-6	-2	0	-1	30	87	38	44	614
Other investment liabilities	percent	n.a.	90	90	89	94	85	87	91	78	83	78	74	72	36	-35	22	2	576
Malaysia	percent	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Foreign direct investment	percent	61	44	36	24	29	39	47	-43	-78	128	117	86	72	43	554	50	54	137
Portfolio investment	percent	-1	39	15	13	40	109	3	-14	49	-8	-13	4	-15	-6	-210	-5	-3	-7
Other investment liabilities	percent	40	17	48	64	31	-49	51	157	130	-20	-4	11	44	63	-244	56	49	-30
Philippines	percent	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Foreign direct investment	percent	-3	6	0	-21	1	4	87	96	164	41	26	18	7	27	26	21	12	20
Portfolio investment	percent	0	0	0	-1	2	5	9	7	9	21	-2	4	5	20	15	37	39	10
Other investment liabilities	percent	103	94	99	123	97	91	4	-3	-73	37	77	77	88	53	59	43	49	71
Singapore	percent	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Foreign direct investment	percent	49	33	63	32	27	30	53	94	91	27	71	287	25	30	58	36	32	19
Portfolio investment	percent	5	3	3	3	0	15	-8	11	1	4	7	-14	16	18	1	2	7	2
Other investment liabilities	percent	46	64	34	64	73	56	55	-5	8	69	21	-172	59	52	41	62	61	79
Thailand	percent	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Foreign direct investment	percent	9	12	14	17	15	9	1,306	32	31	26	26	17	22	13	10	8	13	-27
Portfolio investment	percent	5	2	5	5	6	50	-147	32	15	21	0	-1	10	39	18	16	20	-35
Other investment liabilities	percent	86	87	81	78	79	41	-1,060	36	55	53	74	83	68	48	72	76	67	163
ASEAN-5	percent	n.a.	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Foreign direct investment	percent	n.a.	23	21	19	19	24	33	62	74	33	46	49	33	28	45	27	30	56
Portfolio investment	percent	n.a.	9	6	8	9	36	0	11	1	8	1	0	4	20	15	15	20	8
Other investment liabilities	percent	n.a.	67	73	73	72	40	67	27	26	59	53	52	63	52	40	58	50	36

Source: Derived from IMF, *International Financial Statistics* (June 1999).

Table A.4
Interest Rate Lending and Borrowing Wedge, 1980-1998
(percentages)

[illegible]

Table A.5

Nominal Exchange Rates of ASEAN-5 Countries and Global Regions, 1980-2000

(Local currency per US dollar)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
INDONESIA	627.0	631.8	661.4	909.3	1,025.9	1,110.6	1,282.6	1,643.9	1,685.7	1,770.1	1,842.8	1,950.3	2,029.9	2,087.1	2,160.8	2,248.6	2,342.3	2,909.4	10,013.6	8,000.0	8,000.0
MALAYSIA	2.2	2.3	2.3	2.3	2.3	2.5	2.6	2.5	2.6	2.7	2.7	2.8	2.5	2.6	2.6	2.5	2.5	2.8	3.9	3.8	3.8
PHILIPPINES	7.5	7.9	8.5	11.1	16.7	18.6	20.4	20.6	21.1	21.7	24.3	27.5	25.5	27.1	26.4	25.7	26.2	29.5	40.9	39.4	39.5
SINGAPORE	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.0	2.0	1.8	1.7	1.6	1.6	1.5	1.4	1.4	1.5	1.7	1.7	1.7
THAILAND	20.5	21.8	23.0	23.0	23.6	27.2	26.3	25.7	25.3	25.7	25.6	25.5	25.4	25.3	25.2	24.9	25.3	31.4	41.4	37.0	37.2
JAPAN	226.7	220.5	249.1	237.5	237.5	238.5	168.5	144.6	128.2	138.0	144.8	134.7	126.7	111.2	102.2	94.1	108.8	121.0	130.9	119.5	119.1
USA	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Source:

Table A.6

Nominal Cross Exchange Rates for Indonesia, 1980-2000

(Local currency per trading partner currency)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
INDONESIA	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MALAYSIA	288	274	283	392	438	447	497	652	644	653	681	709	797	811	823	898	931	1,034	2,552	2,105	2,105
PHILIPPINES	83	80	77	82	61	60	63	80	80	81	76	71	80	77	82	87	89	99	245	203	202
SINGAPORE	293	299	309	430	481	505	589	781	838	908	1,017	1,129	1,246	1,292	1,415	1,586	1,661	1,959	5,983	4,661	4,673
THAILAND	31	29	29	40	43	41	49	64	67	69	72	76	80	82	86	90	92	93	242	216	215
JAPAN	3	3	3	4	4	5	8	11	13	13	13	14	16	19	21	24	22	24	76	67	67
UNITED STATES	627	632	661	909	1,026	1,111	1,283	1,644	1,686	1,770	1,843	1,950	2,030	2,087	2,161	2,249	2,342	2,909	10,014	8,000	8,000
AUSTRIA	48	40	39	51	51	54	84	130	137	134	162	167	185	179	189	223	221	238	811	645	649
BELGIUM-LUXEM	21	17	14	18	18	19	29	44	46	45	55	57	63	60	65	76	76	81	277	220	221
DENMARK	111	89	79	99	99	105	159	240	250	242	298	305	336	322	340	401	404	441	1,494	1,187	1,173
FINLAND	168	146	137	163	171	179	253	374	403	412	482	482	453	365	414	515	510	560	1,879	1,574	1,579
FRANCE	148	116	101	119	117	124	185	273	283	277	338	346	383	369	389	450	458	498	1,702	1,353	1,361
GERMANY	345	280	273	356	360	377	591	915	960	942	1,141	1,175	1,300	1,262	1,331	1,569	1,557	1,678	5,707	4,537	4,566
GREECE	15	11	10	10	9	8	9	12	12	11	12	11	11	9	9	10	10	11	34	27	27
IRELAND	1,290	1,021	941	1,135	1,115	1,183	1,721	2,446	2,573	2,512	3,056	3,151	3,462	3,062	3,236	3,606	3,749	4,416	14,319	11,268	11,338
ITALY	1	1	0	1	1	1	1	1	1	1	2	2	2	1	1	1	2	2	6	5	5
NETHERLANDS	315	253	248	319	320	334	523	811	853	835	1,012	1,043	1,154	1,124	1,187	1,400	1,389	1,491	5,061	4,027	4,052
PORTUGAL	13	10	8	8	7	7	9	12	12	11	13	13	15	13	13	15	15	17	56	44	45
SPAIN	9	7	6	6	6	7	9	13	14	15	18	19	20	16	16	18	18	20	67	53	54
SWEDEN	148	125	105	119	124	129	180	259	275	275	311	323	349	268	280	315	349	381	1,260	991	996
UNITED KINGDOM	1,459	1,281	1,158	1,379	1,371	1,440	1,882	2,694	3,003	2,902	3,289	3,451	3,584	3,135	3,309	3,549	3,658	4,765	16,587	12,882	12,569
CHINA,P.R.:HONG KONG	126	113	109	126	131	143	164	211	216	227	237	251	262	270	280	291	303	376	1,293	1,034	1,034
CHINA,P.R.: MAINLAND	418	371	349	460	442	378	371	442	346	358	385	366	368	362	251	269	282	351	1,209	966	966
KOREA	1	1	1	1	1	1	1	2	2	3	3	3	3	3	3	3	3	3	7	7	7

Source:

Table A.7**Nominal Cross Exchange Rates for Malaysia, 1980-2000****(Local currency per trading partner currency)**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
INDONESIA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MALAYSIA	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHILIPPINES	0.29	0.29	0.27	0.21	0.14	0.13	0.13	0.12	0.12	0.12	0.11	0.10	0.10	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10
SINGAPORE	1.02	1.09	1.09	1.10	1.10	1.13	1.19	1.20	1.30	1.39	1.49	1.59	1.56	1.59	1.72	1.77	1.78	1.89	2.34	2.21	2.22
THAILAND	0.11	0.11	0.10	0.10	0.10	0.09	0.10	0.10	0.10	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.09	0.09	0.10	0.10
JAPAN	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.03	0.03	0.03
UNITED STATES	2.18	2.30	2.34	2.32	2.34	2.48	2.58	2.52	2.62	2.71	2.70	2.75	2.55	2.57	2.62	2.50	2.52	2.81	3.92	3.80	3.80
AUSTRIA	0.17	0.14	0.14	0.13	0.12	0.12	0.17	0.20	0.21	0.20	0.24	0.24	0.23	0.22	0.23	0.25	0.24	0.23	0.32	0.31	0.31
BELGIUM-LUXEM	0.07	0.06	0.05	0.05	0.04	0.04	0.06	0.07	0.07	0.07	0.08	0.08	0.08	0.07	0.08	0.08	0.08	0.08	0.11	0.10	0.11
DENMARK	0.39	0.32	0.28	0.25	0.23	0.23	0.32	0.37	0.39	0.37	0.44	0.43	0.42	0.40	0.41	0.45	0.43	0.43	0.59	0.56	0.56
FINLAND	0.58	0.53	0.48	0.42	0.39	0.40	0.51	0.57	0.63	0.63	0.71	0.68	0.57	0.45	0.50	0.57	0.55	0.54	0.74	0.75	0.75
FRANCE	0.52	0.42	0.36	0.30	0.27	0.28	0.37	0.42	0.44	0.42	0.50	0.49	0.48	0.45	0.47	0.50	0.49	0.48	0.67	0.64	0.65
GERMANY	1.20	1.02	0.96	0.91	0.82	0.84	1.19	1.40	1.49	1.44	1.67	1.66	1.63	1.56	1.62	1.75	1.67	1.62	2.24	2.16	2.17
GREECE	0.05	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
IRELAND	4.48	3.73	3.32	2.90	2.55	2.65	3.46	3.75	4.00	3.84	4.49	4.44	4.34	3.78	3.93	4.02	4.03	4.27	5.61	5.35	5.39
ITALY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NETHERLANDS	1.09	0.92	0.87	0.81	0.73	0.75	1.05	1.24	1.32	1.28	1.49	1.47	1.45	1.39	1.44	1.56	1.49	1.44	1.98	1.91	1.92
PORTUGAL	0.04	0.04	0.03	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
SPAIN	0.03	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03
SWEDEN	0.51	0.46	0.37	0.30	0.28	0.29	0.36	0.40	0.43	0.42	0.46	0.45	0.44	0.33	0.34	0.35	0.38	0.37	0.49	0.47	0.47
UNITED KINGDOM	5.06	4.67	4.09	3.52	3.13	3.22	3.79	4.13	4.66	4.44	4.83	4.87	4.50	3.87	4.02	3.95	3.93	4.61	6.50	6.12	5.97
CHINA,P.R.:HONG KONG	0.44	0.41	0.39	0.32	0.30	0.32	0.33	0.32	0.34	0.35	0.35	0.35	0.33	0.33	0.34	0.32	0.33	0.36	0.51	0.49	0.49
CHINA,P.R.: MAINLAND	1.45	1.35	1.23	1.17	1.01	0.85	0.75	0.68	0.54	0.55	0.57	0.52	0.46	0.45	0.30	0.30	0.30	0.34	0.47	0.46	0.46
KOREA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source:

Table A.8

Nominal Cross Exchange Rates for Philippines, 1980-2000

(Local currency per trading partner currency)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
INDONESIA	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
MALAYSIA	3.45	3.43	3.66	4.79	7.13	7.49	7.90	8.16	8.06	8.02	8.99	9.99	10.02	10.54	10.07	10.27	10.42	10.48	10.42	10.37	10.41
PHILIPPINES	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
SINGAPORE	3.51	3.74	3.99	5.26	7.83	8.46	9.36	9.77	10.48	11.15	13.41	15.91	15.66	16.78	17.30	18.14	18.59	19.85	24.43	22.97	23.10
THAILAND	0.37	0.36	0.37	0.48	0.71	0.69	0.78	0.80	0.83	0.85	0.95	1.08	1.00	1.07	1.05	1.03	1.03	0.94	0.99	1.07	1.06
JAPAN	0.03	0.04	0.03	0.05	0.07	0.08	0.12	0.14	0.16	0.16	0.17	0.20	0.20	0.24	0.26	0.27	0.24	0.24	0.31	0.33	0.33
UNITED STATES	7.51	7.90	8.54	11.11	16.70	18.61	20.39	20.57	21.09	21.74	24.31	27.48	25.51	27.12	26.42	25.71	26.22	29.47	40.89	39.42	39.55
AUSTRIA	0.58	0.50	0.50	0.62	0.83	0.90	1.34	1.63	1.71	1.64	2.14	2.35	2.32	2.33	2.31	2.55	2.48	2.41	3.31	3.18	3.21
BELGIUM-LUXEM	0.26	0.21	0.19	0.22	0.29	0.31	0.46	0.55	0.57	0.55	0.73	0.80	0.79	0.78	0.79	0.87	0.85	0.82	1.13	1.08	1.09
DENMARK	1.33	1.11	1.02	1.22	1.61	1.76	2.52	3.01	3.13	2.97	3.93	4.30	4.23	4.18	4.15	4.59	4.52	4.46	6.10	5.85	5.80
FINLAND	2.01	1.83	1.77	2.00	2.78	3.00	4.02	4.68	5.04	5.07	6.36	6.79	5.70	4.75	5.06	5.89	5.71	5.68	7.67	7.75	7.80
FRANCE	1.78	1.45	1.30	1.46	1.91	2.07	2.94	3.42	3.54	3.41	4.46	4.87	4.82	4.79	4.76	5.15	5.12	5.05	6.95	6.67	6.73
GERMANY	4.13	3.50	3.52	4.35	5.87	6.32	9.39	11.44	12.01	11.56	15.05	16.56	16.34	16.40	16.28	17.94	17.42	17.00	23.30	22.36	22.57
GREECE	0.18	0.14	0.13	0.13	0.15	0.13	0.15	0.15	0.15	0.13	0.15	0.15	0.13	0.12	0.11	0.11	0.11	0.11	0.14	0.14	0.14
IRELAND	15.46	12.77	12.15	13.87	18.15	19.83	27.35	30.61	32.19	30.84	40.32	44.39	43.51	39.79	39.57	41.24	41.96	44.74	58.48	55.53	56.05
ITALY	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
NETHERLANDS	3.78	3.17	3.20	3.89	5.20	5.60	8.32	10.15	10.67	10.25	13.35	14.70	14.51	14.60	14.51	16.01	15.55	15.10	20.67	19.85	20.03
PORTUGAL	0.15	0.13	0.11	0.10	0.11	0.11	0.14	0.15	0.15	0.14	0.17	0.19	0.19	0.17	0.16	0.17	0.17	0.17	0.23	0.22	0.22
SPAIN	0.10	0.09	0.08	0.08	0.10	0.11	0.15	0.17	0.18	0.18	0.24	0.26	0.25	0.21	0.20	0.21	0.21	0.20	0.27	0.26	0.27
SWEDEN	1.78	1.56	1.36	1.45	2.02	2.16	2.86	3.24	3.44	3.37	4.11	4.54	4.38	3.48	3.42	3.60	3.91	3.86	5.14	4.89	4.92
UNITED KINGDOM	17.47	16.02	14.95	16.86	22.32	24.12	29.91	33.71	37.58	35.64	43.39	48.62	45.04	40.73	40.46	40.59	40.94	48.26	67.74	63.49	62.13
CHINA,P.R.:HONG KONG	1.51	1.42	1.41	1.54	2.14	2.39	2.61	2.64	2.70	2.79	3.12	3.54	3.30	3.51	3.42	3.32	3.39	3.81	5.28	5.09	5.11
CHINA,P.R.: MAINLAND	5.01	4.63	4.51	5.62	7.20	6.34	5.90	5.53	4.33	4.39	5.08	5.16	4.63	4.71	3.07	3.08	3.16	3.55	4.94	4.76	4.78
KOREA	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03

Source:

Table A.9

Nominal Cross Exchange Rates for Singapore, 1980-2000

(Local currency per trading partner currency)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
INDONESIA	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000
MALAYSIA	0.984	0.917	0.916	0.910	0.910	0.886	0.843	0.836	0.768	0.720	0.670	0.628	0.639	0.628	0.582	0.566	0.560	0.528	0.426	0.452	0.451
PHILIPPINES	0.285	0.267	0.251	0.190	0.128	0.118	0.107	0.102	0.095	0.090	0.075	0.063	0.064	0.060	0.058	0.055	0.054	0.050	0.041	0.044	0.043
SINGAPORE	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
THAILAND	0.105	0.097	0.093	0.092	0.090	0.081	0.083	0.082	0.080	0.076	0.071	0.068	0.064	0.064	0.061	0.057	0.056	0.047	0.040	0.046	0.046
JAPAN	0.009	0.010	0.009	0.009	0.009	0.009	0.013	0.015	0.016	0.014	0.013	0.013	0.013	0.015	0.015	0.015	0.013	0.012	0.013	0.014	0.014
UNITED STATES	2.141	2.113	2.140	2.113	2.133	2.200	2.177	2.106	2.012	1.950	1.813	1.728	1.629	1.616	1.527	1.417	1.410	1.485	1.674	1.716	1.712
AUSTRIA	0.165	0.133	0.125	0.118	0.107	0.106	0.143	0.167	0.163	0.147	0.159	0.148	0.148	0.139	0.134	0.141	0.133	0.122	0.136	0.138	0.139
BELGIUM-LUXEM	0.073	0.057	0.047	0.041	0.037	0.037	0.049	0.056	0.055	0.049	0.054	0.051	0.051	0.047	0.046	0.048	0.046	0.042	0.046	0.047	0.047
DENMARK	0.380	0.297	0.257	0.231	0.206	0.208	0.269	0.308	0.299	0.267	0.293	0.270	0.270	0.249	0.240	0.253	0.243	0.225	0.250	0.255	0.251
FINLAND	0.574	0.490	0.444	0.379	0.355	0.355	0.430	0.479	0.481	0.454	0.474	0.427	0.364	0.283	0.292	0.325	0.307	0.286	0.314	0.338	0.338
FRANCE	0.507	0.389	0.326	0.277	0.244	0.245	0.314	0.350	0.338	0.306	0.333	0.306	0.308	0.285	0.275	0.284	0.276	0.254	0.284	0.290	0.291
GERMANY	1.178	0.935	0.882	0.828	0.750	0.747	1.003	1.172	1.146	1.037	1.122	1.041	1.043	0.977	0.941	0.989	0.937	0.856	0.954	0.973	0.977
GREECE	0.050	0.038	0.032	0.024	0.019	0.016	0.016	0.016	0.014	0.012	0.011	0.009	0.009	0.007	0.006	0.006	0.006	0.005	0.006	0.006	0.006
IRELAND	4.407	3.416	3.043	2.638	2.319	2.345	2.921	3.134	3.071	2.767	3.006	2.791	2.778	2.371	2.288	2.273	2.257	2.254	2.393	2.417	2.426
ITALY	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
NETHERLANDS	1.077	0.847	0.801	0.740	0.665	0.662	0.889	1.040	1.018	0.920	0.995	0.924	0.926	0.870	0.839	0.883	0.836	0.761	0.846	0.864	0.867
PORTUGAL	0.043	0.034	0.027	0.019	0.015	0.013	0.015	0.015	0.014	0.012	0.013	0.012	0.012	0.010	0.009	0.009	0.009	0.008	0.009	0.009	0.010
SPAIN	0.030	0.023	0.019	0.015	0.013	0.013	0.016	0.017	0.017	0.016	0.018	0.017	0.016	0.013	0.011	0.011	0.011	0.010	0.011	0.011	0.011
SWEDEN	0.506	0.417	0.341	0.276	0.258	0.256	0.306	0.332	0.328	0.303	0.306	0.286	0.280	0.208	0.198	0.199	0.210	0.194	0.211	0.213	0.213
UNITED KINGDOM	4.981	4.284	3.746	3.205	2.851	2.852	3.194	3.451	3.585	3.198	3.235	3.057	2.876	2.427	2.339	2.237	2.202	2.432	2.772	2.764	2.690
CHINA,P.R.:HKONG	0.430	0.379	0.354	0.292	0.273	0.282	0.279	0.270	0.258	0.250	0.233	0.222	0.210	0.209	0.198	0.183	0.182	0.192	0.216	0.222	0.221
CHINA,P.R.: MLND	1.429	1.239	1.131	1.070	0.919	0.749	0.631	0.566	0.413	0.394	0.379	0.325	0.295	0.280	0.177	0.170	0.170	0.179	0.202	0.207	0.207
KOREA	0.004	0.003	0.003	0.003	0.003	0.003	0.002	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001

Source:

Table A.10

Nominal Cross Exchange Rates for Thailand, 1980-2000

(Local currency per trading partner currency)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
INDONESIA	0.033	0.035	0.035	0.025	0.023	0.024	0.021	0.016	0.015	0.015	0.014	0.013	0.013	0.012	0.012	0.011	0.011	0.011	0.004	0.005	0.005
MALAYSIA	9.406	9.470	9.849	9.908	10.087	10.938	10.188	10.209	9.659	9.488	9.459	9.279	9.971	9.836	9.584	9.949	10.073	11.149	10.539	9.737	9.786
PHILIPPINES	2.726	2.762	2.693	2.070	1.416	1.460	1.290	1.251	1.199	1.182	1.052	0.929	0.996	0.934	0.952	0.969	0.967	1.064	1.011	0.938	0.940
SINGAPORE	9.563	10.328	10.748	10.885	11.082	12.344	12.078	12.214	12.569	13.179	14.116	14.771	15.593	15.670	16.465	17.578	17.973	21.123	24.713	21.558	21.720
THAILAND	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
JAPAN	0.090	0.099	0.092	0.097	0.100	0.114	0.156	0.178	0.197	0.186	0.177	0.189	0.201	0.228	0.246	0.265	0.233	0.259	0.316	0.310	0.312
UNITED STATES	20.476	21.820	23.000	23.000	23.639	27.159	26.299	25.723	25.294	25.702	25.586	25.517	25.400	25.320	25.150	24.915	25.343	31.364	41.359	37.000	37.185
AUSTRIA	1.583	1.370	1.348	1.280	1.181	1.313	1.723	2.035	2.048	1.943	2.250	2.185	2.311	2.177	2.202	2.471	2.394	2.570	3.351	2.983	3.016
BELGIUM-LUXEM	0.700	0.588	0.503	0.450	0.409	0.457	0.589	0.689	0.688	0.652	0.766	0.747	0.790	0.732	0.752	0.845	0.819	0.877	1.143	1.017	1.029
DENMARK	3.633	3.063	2.760	2.515	2.283	2.563	3.250	3.760	3.758	3.516	4.134	3.989	4.208	3.905	3.954	4.447	4.370	4.749	6.172	5.488	5.450
FINLAND	5.490	5.057	4.771	4.129	3.933	4.382	5.188	5.852	6.047	5.989	6.692	6.310	5.670	4.432	4.815	5.706	5.517	6.042	7.760	7.278	7.338
FRANCE	4.846	4.015	3.500	3.018	2.705	3.023	3.797	4.279	4.246	4.028	4.699	4.523	4.798	4.471	4.530	4.992	4.954	5.374	7.031	6.257	6.328
GERMANY	11.265	9.655	9.478	9.008	8.306	9.225	12.111	14.311	14.402	13.671	15.835	15.376	16.265	15.314	15.498	17.385	16.842	18.087	23.570	20.985	21.222
GREECE	0.480	0.394	0.344	0.261	0.210	0.197	0.188	0.190	0.178	0.158	0.161	0.140	0.133	0.110	0.104	0.108	0.105	0.115	0.140	0.127	0.127
IRELAND	42.140	35.277	32.710	28.710	25.699	28.942	35.280	38.279	38.602	36.471	42.433	41.223	43.314	37.146	37.669	39.958	40.564	47.610	59.144	52.114	52.702
ITALY	0.024	0.019	0.017	0.015	0.013	0.014	0.018	0.020	0.019	0.019	0.021	0.021	0.021	0.016	0.016	0.015	0.016	0.018	0.024	0.021	0.021
NETHERLANDS	10.299	8.745	8.614	8.059	7.367	8.177	10.734	12.698	12.797	12.119	14.051	13.648	14.444	13.632	13.819	15.517	15.032	16.074	20.904	18.625	18.835
PORTUGAL	0.409	0.355	0.289	0.208	0.161	0.159	0.176	0.183	0.176	0.163	0.179	0.177	0.188	0.157	0.152	0.165	0.164	0.179	0.230	0.205	0.207
SPAIN	0.286	0.236	0.209	0.160	0.147	0.160	0.188	0.208	0.217	0.217	0.251	0.246	0.248	0.199	0.188	0.200	0.200	0.214	0.278	0.247	0.249
SWEDEN	4.841	4.309	3.661	3.000	2.858	3.157	3.692	4.057	4.128	3.987	4.323	4.219	4.361	3.253	3.259	3.493	3.779	4.108	5.203	4.585	4.628
UNITED KINGDOM	47.634	44.250	40.262	34.891	31.590	35.207	38.581	42.157	45.058	42.144	45.663	45.149	44.844	38.031	38.520	39.328	39.579	51.365	68.508	59.581	58.424
CHINA,P.R.:HKONG	4.116	3.913	3.800	3.183	3.024	3.486	3.370	3.299	3.240	3.295	3.285	3.284	3.281	3.273	3.254	3.221	3.277	4.051	5.340	4.780	4.804
CHINA,P.R.: MNLD	13.666	12.801	12.153	11.642	10.189	9.248	7.617	6.911	5.191	5.196	5.349	4.793	4.606	4.394	2.918	2.983	3.053	3.783	4.995	4.469	4.491
KOREA	0.034	0.032	0.031	0.030	0.029	0.031	0.030	0.031	0.035	0.038	0.036	0.035	0.033	0.032	0.031	0.032	0.032	0.033	0.030	0.031	0.031

Source:

Table A.11**General Price Index, 1980-2000****(Based on Consumer Price Index, 1990=100)**

	1980	1981	1982	1983	1984	1985	1986	1987
INDONESIA	43.9	49.2	53.9	60.3	66.5	69.7	73.8	80.6
MALAYSIA	72.9	80.0	84.6	87.8	91.2	93.5	93.9	94.6
PHILIPPINES	27.0	30.6	33.7	37.1	55.8	68.7	69.2	71.8
SINGAPORE	80.0	86.6	89.9	91.0	93.4	93.8	92.5	93.0
THAILAND	64.9	73.1	76.4	80.0	80.5	82.5	84.0	86.1
JAPAN	81.6	85.6	88.0	89.6	91.7	93.5	94.1	94.2
UNITED STATES	63.0	69.5	72.4	76.2	79.5	82.3	83.9	87.0
AUSTRIA	72.0	76.9	81.1	83.8	88.5	91.4	93.0	94.3
BELGIUM-LUXEM	64.1	69.0	75.0	80.8	85.9	90.1	91.3	92.7
DENMARK	56.4	62.9	69.3	74.1	78.8	82.5	85.5	88.9
FINLAND	52.3	58.6	64.0	69.4	74.2	78.6	80.8	84.1
FRANCE	54.3	61.5	68.9	75.4	81.2	85.9	88.1	91.0
GERMANY	77.4	82.2	86.6	89.4	91.6	93.5	93.3	93.6
GREECE	28.1	30.2	32.9	35.4	37.7	45.0	55.3	64.4
IRELAND	47.7	57.4	67.2	74.2	80.6	85.0	88.3	91.0
ITALY	39.3	47.0	54.7	62.7	69.6	75.9	80.3	84.1
NETHERLANDS	78.8	84.1	89.1	91.7	94.8	97.0	97.0	96.0
PORTUGAL	20.8	24.9	30.6	38.2	49.5	59.0	65.9	72.2
SPAIN	41.0	47.0	53.8	60.4	67.2	73.1	79.5	83.7
SWEDEN	48.1	54.0	58.6	63.8	68.9	74.0	77.1	80.4
UNITED KINGDOM	55.1	61.8	67.0	70.5	73.6	77.4	80.3	83.5
CHINA,P.R.: MAINLAND	51.3	52.5	53.5	54.3	55.9	60.8	64.4	69.1
CHINA,P.R.:HONG KONG	46.2	52.5	58.1	63.9	69.1	70.9	73.1	77.1
KOREA	54.5	66.2	70.9	73.3	75.0	76.8	78.9	81.4

Source:

Table A.12

Direction of Trade (Imports + Exports) of Indonesia, 1980-2000

(millions of US\$)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
INDONESIA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MALAYSIA	96	107	116	118	184	129	133	233	484	582	543	748	1,012	1,103	1,424	1,829	1,933	2,474	2,710
PHILIPPINES	272	692	521	424	181	222	137	172	123	206	216	249	233	342	439	653	778	909	970
SINGAPORE	3,420	3,564	5,940	6,592	3,917	2,465	2,208	2,807	2,552	2,847	3,186	4,108	4,984	5,165	5,817	6,104	7,440	8,812	9,600
THAILAND	323	183	225	257	153	129	155	163	247	448	372	545	697	703	806	1,562	1,918	1,803	2,060
ASEAN-5	4,110	4,546	6,801	7,391	4,435	2,945	2,632	3,374	3,406	4,082	4,317	5,650	6,927	7,314	8,487	10,148	12,069	13,998	15,360
JAPAN	14,206	15,405	15,471	13,471	13,660	11,238	9,772	10,989	11,514	13,085	16,378	17,094	16,774	17,421	19,247	22,064	21,389	21,028	15,000
UNITED STATES	5,712	6,155	5,963	6,800	7,065	5,761	4,384	4,764	4,872	5,691	5,884	6,905	8,242	8,484	9,658	10,920	11,854	12,883	11,100
AUSTRIA	14	20	80	99	55	32	54	96	88	101	104	138	228	310	250	337	342	307	210
BELGIUM-LUXEMBOURG	81	106	116	157	165	146	179	251	336	339	458	511	726	706	649	894	1,075	1,131	1,100
DENMARK	52	30	63	25	26	21	32	39	42	67	114	123	221	256	216	218	317	319	300
FINLAND	38	36	25	24	24	21	23	54	39	57	67	98	123	284	207	328	412	409	300
FRANCE	358	400	648	644	481	355	374	494	643	615	948	930	1,311	1,353	1,267	1,614	1,570	1,651	1,360
GERMANY	1,074	1,163	1,445	994	1,066	932	1,053	1,197	1,364	1,405	2,279	2,975	3,119	3,251	3,626	4,220	4,490	4,331	3,960
GREECE	5	97	4	4	5	3	7	5	5	6	15	23	36	58	95	126	162	158	110
IRELAND	4	4	5	9	13	10	7	13	23	30	109	56	70	62	62	68	77	90	50
ITALY	331	275	246	244	281	253	296	412	471	594	686	917	1,141	1,138	1,332	1,592	1,956	1,720	1,440
NETHERLANDS	530	572	450	547	598	607	642	810	913	940	1,295	1,342	1,607	1,712	1,620	2,188	2,160	2,153	1,490
PORTUGAL	9	1	1	2	2	4	9	16	25	26	23	18	18	31	37	52	51	45	40
SPAIN	58	103	120	251	135	138	87	127	238	163	289	300	433	595	598	659	1,158	1,259	1,100
SWEDEN	60	87	84	114	122	105	128	162	126	191	233	312	313	502	372	313	877	455	400
UNITED KINGDOM	403	682	572	563	465	492	538	537	691	730	958	1,257	1,563	1,787	1,704	2,034	2,311	2,361	2,050
EUROPEAN UNION	3,016	3,576	3,860	3,676	3,435	3,119	3,426	4,212	5,004	5,264	7,577	9,000	10,907	12,043	12,034	14,643	16,957	16,389	14,250
CHINA,P.R.:HONG KONG	291	215	232	247	347	401	440	524	688	708	891	935	1,110	1,148	1,776	2,091	1,887	2,163	2,410
CHINA,P.R.: MAINLAND	197	262	245	231	232	333	476	751	901	1,072	1,487	2,026	2,148	2,185	2,793	3,418	3,655	3,967	3,860
KOREA	528	784	915	714	808	861	515	942	1,290	1,477	2,355	3,387	3,977	4,324	4,986	5,528	5,692	5,979	6,090

Table A.13

Direction of Trade (Imports + Exports) of Malaysia, 1980-2000
(millions of US\$)

	1980	1981	1982	1983	1984	1985	1986	1987	1988
INDONESIA	115	128	107	156	273	205	198	323	561
MALAYSIA	-	-	-	-	-	-	-	-	-
PHILIPPINES	305	281	284	322	605	598	372	471	451
SINGAPORE	3,745	4,197	4,787	5,026	5,219	4,939	3,996	5,137	6,261
THAILAND	509	591	901	976	946	963	790	954	921
ASEAN-5	4,673	5,196	6,080	6,480	7,043	6,704	5,356	6,885	8,201
JAPAN	5,428	5,318	5,550	6,144	7,461	6,617	5,477	6,254	7,351
UNITED STATES	3,751	3,226	3,581	3,991	4,526	3,851	4,331	5,348	6,581
AUSTRIA	16	14	17	21	19	32	25	30	41
BELGIUM-LUXEMBOURG	173	132	140	217	230	220	222	305	351
DENMARK	61	82	83	51	72	72	60	68	81
FINLAND	13	25	20	22	33	34	26	37	41
FRANCE	434	379	301	488	489	446	422	442	561
GERMANY	1,053	862	864	1,137	1,097	955	988	1,154	1,371
GREECE	9	6	9	8	9	8	12	15	21
IRELAND	23	19	19	20	23	18	18	19	21
ITALY	335	245	238	259	314	271	263	302	381
NETHERLANDS	843	796	812	886	814	1,036	567	722	761
PORTUGAL	30	42	66	70	79	102	92	66	71
SPAIN	94	81	61	91	82	72	73	95	131
SWEDEN	173	156	114	154	187	216	150	154	171
UNITED KINGDOM	943	874	837	854	927	883	973	1,120	1,551
EUROPEAN UNION	4,202	3,713	3,580	4,278	4,374	4,365	3,892	4,528	5,571
CHINA,P.R.:HONG KONG	391	385	396	439	513	416	535	787	1,091
CHINA,P.R.: MAINLAND	470	363	387	426	450	412	445	654	851
KOREA	464	594	701	900	1,081	1,182	967	1,286	1,451

Table A.14

Direction of Trade (Imports + Exports) of Philippines, 1980-2000

(millions of US\$)

		1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
INDONESIA		294	386	208	207	207	208	165	157	186	237	261	220	221	391	470	746	-	885	955	955	
MALAYSIA		257	287	300	321	533	564	312	353	363	382	414	527	541	517	707	936	1,479	2,112	2,408	2,408	2,408
PHILIPPINES		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SINGAPORE		245	243	342	429	441	377	280	434	574	737	748	705	803	1,357	2,196	2,272	2,913	5,047	5,055	5,055	5,055
THAILAND		85	54	47	70	60	139	97	169	179	245	306	321	237	346	212	1,221	1,355	1,266	1,366	1,366	1,366
ASEAN-5		881	970	896	1,027	1,241	1,287	854	1,112	1,303	1,601	1,729	1,773	1,802	2,612	3,585	5,175	5,747	9,310	9,784	9,784	9,784
JAPAN		3,191	2,863	2,811	2,326	1,885	1,624	1,738	2,129	2,918	3,755	4,019	4,288	4,832	5,833	7,467	9,043	10,584	14,122	12,433	12,433	12,433
UNITED STATES		3,544	3,701	3,449	3,624	3,745	3,002	3,003	3,600	4,335	5,067	5,642	5,761	6,469	7,873	9,340	11,442	13,209	17,986	18,623	18,623	18,623
AUSTRIA	9		12	14	17	33	19	12	12	15	25	30	29	27	33	41	39	-	87	109	109	109
BELGIUM-LUXEM		71	62	58	74	101	34	49	69	107	152	174	191	189	206	339	298	-	344	332	332	332
DENMARK		36	40	51	71	21	19	22	41	44	44	48	61	53	52	59	59	-	108	119	119	119
FINLAND		11	45	10	11	12	11	12	20	23	33	25	32	27	90	102	78	118	145	165	165	165
FRANCE		189	221	189	185	231	161	190	254	293	326	305	313	391	411	441	526	630	2,194	1,200	1,200	1,200
GERMANY		600	576	559	588	379	323	457	573	639	769	977	992	1,192	1,196	1,463	1,675	2,055	2,607	2,264	2,264	2,264
GREECE	3	3		2	2	3	4	4	5	5	8	6		10	7	6		10	11	-	13	15
IRELAND	7		10	13	13	9	9	16	14	26	23	29	26	39	47	58	133	-	354	618	618	618
ITALY		137	115	85	93	54	62	48	72	158	119	155	184	220	221	269	355	386	550	436	436	436
NETHERLANDS		485	402	282	304	224	190	288	403	450	542	538	493	587	596	809	1,141	1,440	1,657	1,281	1,281	1,281
PORTUGAL	3	2		6	2	1	1	3	3	5	9		12	11	12	9	8		10	-	26	26
SPAIN		32	34	91	46	34	25	30	89	71	71	71	86	133	91	117	142	-	239	251	251	251
SWEDEN		88	67	56	50	41	32	33	39	46	55	55	54	51	81	94	125	220	334	367	367	367
UNITED KINGDOM		337	369	363	411	371	273	339	393	496	507	617	597	767	914	1,043	1,496	1,411	2,213	1,938	1,938	1,938
EUROPEAN UNION		2,008	1,958	1,779	1,869	1,515	1,165	1,504	1,986	2,377	2,683	3,042	3,078	3,693	3,952	4,854	6,088	6,260	10,870	9,122	9,122	9,122
CHINA,P.R.: H KONG		395	446	417	423	477	396	479	586	732	802	907	1,006	1,184	1,425	1,796	2,197	2,211	3,583	3,060	3,060	3,060
CHINA,P.R.: MLAND		266	288	328	102	288	371	222	305	333	292	243	371	298	349	484	869	981	1,765	1,985	1,985	1,985

Table A.15

Direction of Trade (Imports + Exports) of Singapore, 1980-2000

(millions of US\$)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
INDONESIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MALAYSIA	6,232	6,681	7,447	7,931	8,208	7,275	6,727	8,612	11,763	12,628	15,130	18,928	18,541	24,539	35,754
PHILIPPINES	348	381	425	549	392	417	432	595	782	931	984	956	1,126	1,877	2,358
SINGAPORE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
THAILAND	1,319	1,355	1,328	1,450	1,787	1,493	1,559	2,232	3,330	3,718	5,160	5,812	6,636	7,731	10,241
ASEAN-5	7,900	8,418	9,200	9,930	10,387	9,186	8,718	11,439	15,875	17,276	21,273	25,696	26,302	34,147	48,352
JAPAN	5,871	7,313	7,306	7,082	7,516	6,634	7,009	9,273	13,025	14,440	16,879	19,248	20,027	24,189	29,277
UNITED STATES	5,813	6,254	6,244	8,216	9,002	8,818	9,077	11,786	16,194	18,954	21,016	22,175	25,278	29,030	33,723
AUSTRIA	40	42	48	54	55	57	70	93	136	183	239	279	378	302	357
BELGIUM-LUXEMBOURG	209	194	192	195	214	221	208	292	436	609	748	701	859	932	1,085
DENMARK	89	99	106	156	100	107	111	222	250	216	250	261	383	255	306
FINLAND	21	30	29	44	53	49	53	66	103	133	159	177	264	395	486
FRANCE	751	836	841	809	777	948	774	1,189	1,443	1,815	2,331	2,390	2,772	2,809	3,477
GERMANY	1,368	1,298	1,350	1,273	1,357	1,228	1,549	2,049	2,992	3,452	4,312	4,624	5,053	5,546	6,867
GREECE	128	113	94	71	116	150	73	103	166	145	202	181	176	415	206
IRELAND	20	27	25	40	56	33	29	49	111	113	209	243	315	633	896
ITALY	475	454	444	573	673	625	569	769	1,224	1,410	1,655	1,473	1,937	1,792	2,131
NETHERLANDS	676	566	568	493	526	543	573	774	1,017	1,190	1,668	2,122	2,643	2,713	3,636
PORTUGAL	26	16	17	27	24	16	18	24	38	42	58	68	75	85	87
SPAIN	126	102	97	137	159	125	117	169	285	313	442	491	555	558	722
SWEDEN	287	271	225	162	189	193	208	330	340	435	494	572	550	555	673
UNITED KINGDOM	1,311	1,322	1,222	1,277	1,391	1,396	1,456	1,850	2,418	2,950	3,553	3,701	3,858	4,451	5,426
EUROPEAN UNION	5,528	5,369	5,257	5,311	5,692	5,692	5,807	7,980	10,960	13,006	16,320	17,285	19,818	21,439	26,357
CHINA,P.R.:HONG KONG	1,990	2,354	2,340	2,082	2,089	1,947	2,063	2,675	3,666	4,245	5,309	6,252	7,166	9,114	11,838
CHINA,P.R.: MAINLAND	936	951	1,121	1,040	1,590	2,601	2,001	2,149	2,884	2,897	2,893	3,086	3,366	4,309	4,983
KOREA	562	606	664	885	750	704	916	1,351	2,035	2,354	2,948	3,282	3,434	4,810	6,447

[illegible]

Table A.16

Direction of Trade (Imports + Exports) of Thailand

(millions of US\$)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
INDONESIA	281	159	207	154	126	104	120	170	258	430	352	434	574	715	893
MALAYSIA	458	588	800	839	856	902	766	909	899	1,235	1,700	1,875	2,437	2,715	4,309
PHILIPPINES	102	40	53	83	43	113	100	212	250	190	276	203	276	379	577
SINGAPORE	1,101	1,246	1,042	1,154	1,445	1,254	1,388	2,061	2,735	3,303	4,176	5,326	5,793	7,428	9,606
THAILAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ASEAN-5	1,943	2,034	2,103	2,229	2,470	2,373	2,373	3,352	4,141	5,157	6,504	7,837	9,079	11,237	15,384
JAPAN	2,934	3,409	2,955	3,776	3,768	3,402	3,681	5,108	8,038	11,158	14,113	16,173	17,591	20,263	24,170
UNITED STATES	2,156	2,202	2,025	2,252	2,682	2,454	2,918	3,783	5,953	7,199	8,841	10,057	12,079	13,384	15,976
AUSTRIA	46	52	16	28	27	28	35	52	75	100	156	324	205	275	211
BELGIUM-LUXEMBOURG	213	166	139	185	174	165	199	332	544	632	871	1,524	842	1,349	1,140
DENMARK	70	51	55	77	85	82	103	123	146	145	228	278	315	343	334
FINLAND	45	26	21	28	23	23	23	48	78	107	159	173	204	369	314
FRANCE	200	307	259	279	294	382	352	482	870	851	1,381	1,221	1,684	1,690	1,561
GERMANY	671	653	564	703	681	767	939	1,344	1,827	2,129	2,900	3,564	3,592	3,961	4,810
GREECE	11	5	5	6	10	8	8	11	20	40	52	73	90	78	68
IRELAND	7	9	20	10	10	16	10	19	31	28	37	40	55	51	75
ITALY	258	215	203	229	250	228	245	386	534	667	847	1,069	1,167	1,370	1,311
NETHERLANDS	1,088	984	1,012	807	856	597	739	930	1,086	1,194	1,357	1,574	1,832	1,559	1,760
PORTUGAL	5	6	7	4	10	26	38	34	47	58	64	62	102	91	99
SPAIN	28	35	32	40	48	48	72	117	161	261	328	428	450	447	510
SWEDEN	128	110	87	115	128	108	145	169	234	303	415	464	481	553	610
UNITED KINGDOM	368	379	350	364	407	406	578	826	1,188	1,397	1,843	1,877	2,116	2,248	2,498
EUROPEAN UNION	3,138	2,999	2,770	2,876	3,001	2,885	3,486	4,874	6,841	7,913	10,635	12,670	13,134	14,386	15,301
CHINA,P.R.:HONG KONG	417	427	431	434	410	396	493	677	963	1,206	1,453	2,124	2,000	2,496	3,078
CHINA,P.R.: MAINLAND	540	507	540	372	501	494	539	891	1,154	1,286	1,376	1,485	1,605	1,334	2,318
KOREA	247	290	237	335	414	319	462	464	817	1,042	1,439	2,053	2,318	2,409	2,550

[illegible]

Table A.17

Direction of Trade (Imports + Exports) of ASEAN-5, 1980-2000

(millions of US\$)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	
INDONESIA	691	673	522	516	606	517	483	650	1,008	1,427	1,271	1,662	1,937	2,367	3,020	4
MALAYSIA	7,042	7,663	8,662	9,209	9,781	8,870	7,938	10,105	13,509	14,827	17,788	22,078	22,530	28,875	42,194	45
PHILIPPINES	1,026	1,395	1,283	1,377	1,221	1,349	1,041	1,450	1,604	1,810	2,026	1,873	2,352	3,297	4,306	5
SINGAPORE	8,511	9,250	12,111	13,202	11,022	9,035	7,872	10,439	12,127	14,894	19,170	23,859	27,240	31,133	38,172	45
THAILAND	2,236	2,183	2,501	2,754	2,946	2,724	2,600	3,518	4,678	5,704	7,573	8,667	10,054	11,609	14,950	20
ASEAN-5	19,506	21,164	25,079	27,059	25,577	22,495	19,934	26,162	32,926	38,662	47,827	58,139	64,113	77,281	102,642	125
JAPAN	31,630	34,308	34,094	32,799	34,291	29,514	27,678	33,753	42,890	51,892	62,950	71,843	75,004	86,351	103,078	128
UNITED STATES	20,976	21,539	21,262	24,883	27,020	23,885	23,713	29,281	37,942	45,399	51,313	56,332	65,992	76,077	91,044	109
AUSTRIA	126	140	174	218	189	168	196	283	361	476	612	896	982	1,064	1,022	1
BELGIUM-LUXEMBOURG	747	658	645	828	884	786	857	1,249	1,758	2,182	2,841	3,552	3,394	4,016	4,332	5
DENMARK	308	302	358	381	303	302	328	493	572	578	766	874	1,172	1,088	1,121	1
FINLAND	128	162	104	129	145	138	136	225	289	395	484	577	805	1,307	1,314	1
FRANCE	1,933	2,142	2,238	2,405	2,272	2,292	2,112	2,861	3,812	4,262	5,816	5,796	7,246	7,581	9,117	12
GERMANY	4,767	4,553	4,781	4,695	4,580	4,205	4,986	6,318	8,192	9,505	12,884	14,993	16,276	17,419	21,207	25
GREECE	157	225	114	92	143	173	104	139	216	221	300	317	347	603	427	
IRELAND	61	69	82	91	111	86	79	114	220	250	449	485	576	927	1,591	2
ITALY	1,536	1,304	1,216	1,399	1,572	1,440	1,421	1,941	2,767	3,286	4,013	4,421	5,359	5,448	6,276	7
NETHERLANDS	3,622	3,321	3,124	3,037	3,018	2,974	2,810	3,639	4,226	5,008	5,854	6,687	7,997	8,083	9,579	12
PORTUGAL	73	68	98	105	116	150	160	144	191	165	203	198	239	241	317	
SPAIN	337	356	401	566	458	407	380	597	891	950	1,297	1,506	1,790	1,924	2,297	3
SWEDEN	736	690	567	595	666	655	663	853	916	1,230	1,506	1,905	1,754	2,081	2,352	2
UNITED KINGDOM	3,362	3,626	3,344	3,469	3,561	3,450	3,883	4,726	6,344	7,741	9,731	10,633	11,308	12,809	14,805	18
EUROPEAN UNION	17,892	17,615	17,246	18,011	18,017	17,225	18,116	23,580	30,756	36,249	46,757	52,840	59,244	64,592	75,757	95,16
CHINA,P.R.:HONG KONG	3,485	3,826	3,816	3,625	3,835	3,555	4,009	5,249	7,146	8,194	10,052	12,218	13,914	17,045	22,392	27
CHINA,P.R.: MAINLAND	2,410	2,371	2,621	2,172	3,060	4,211	3,683	4,750	6,169	6,637	7,180	8,408	9,164	10,477	13,874	18
KOREA	2,150	2,590	2,829	3,144	3,307	3,355	3,140	4,342	6,089	7,294	9,573	12,174	13,204	15,669	18,988	24

Table A.18

Real Effective Exchange Rates of Indonesia, 1980-2000
(1995=100)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
INDONESIA	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
MALAYSIA	142.3	152.9	153.2	119.4	113.6	113.5	107.8	89.0	97.3	99.4	100.0	102.4	93.6	97.4	100.4	97.4	97.9	91.5	56.6	84.9	88.9
PHILIPPINES	147.3	152.5	156.5	150.5	147.2	128.9	128.5	106.5	105.9	98.5	100.0	98.4	86.7	91.3	85.5	81.0	78.9	72.5	43.1	61.4	63.9
SINGAPORE	190.3	193.1	197.1	156.4	150.5	149.6	137.6	112.9	112.0	107.5	100.0	95.2	90.7	93.9	90.2	86.5	88.0	77.9	41.1	67.8	73.5
THAILAND	159.0	167.4	176.6	137.2	137.1	148.8	129.7	105.5	105.3	102.8	100.0	97.5	96.4	99.1	98.2	96.7	96.3	96.9	55.2	77.3	82.1
ASEAN-5	182.5	183.4	191.7	154.5	147.9	145.8	134.7	110.1	108.9	105.2	100.0	96.5	91.5	94.7	92.2	89.4	90.0	81.7	45.0	71.0	76.2
JAPAN	247.2	255.3	293.6	223.5	213.9	203.7	131.1	95.8	88.9	94.8	100.0	93.1	88.9	82.3	78.7	76.2	91.2	85.6	43.0	63.1	69.2
UNITED STATES	204.6	206.4	207.6	160.4	150.3	140.5	126.4	103.9	105.3	101.8	100.0	99.2	99.4	103.0	105.2	107.6	108.4	90.9	41.8	65.7	70.5
AUSTRIA	203.7	261.5	277.9	230.3	237.6	230.3	153.1	106.6	107.7	116.0	100.0	102.7	96.0	104.6	104.6	94.9	101.4	99.0	46.3	74.0	79.8
BELGIUM-LUXEM	175.9	231.1	273.7	231.4	240.6	228.1	155.3	109.0	111.8	117.8	100.0	102.3	97.2	108.5	107.5	98.1	104.7	102.1	47.8	76.2	82.1
DENMARK	208.3	262.5	291.7	243.5	253.9	240.0	162.1	112.3	111.4	117.0	100.0	104.3	99.6	112.7	113.6	103.1	108.3	103.6	48.2	76.4	83.3
FINLAND	240.5	276.7	295.8	256.5	253.1	238.6	173.9	123.5	117.8	114.9	100.0	104.9	116.7	155.4	147.3	128.2	139.0	133.2	62.9	94.8	101.9
FRANCE	184.3	232.9	263.1	226.7	236.3	222.1	153.0	109.6	111.5	116.9	100.0	103.7	98.2	109.8	111.0	103.1	107.3	103.8	48.5	77.9	84.1
GERMANY	187.5	244.1	260.6	215.9	229.9	225.5	152.6	107.5	109.3	115.4	100.0	102.6	94.9	102.6	102.8	93.7	100.5	97.7	45.7	73.3	79.3
GREECE	123.3	165.9	192.4	191.6	225.6	224.2	169.3	120.0	116.7	119.1	100.0	99.4	92.7	104.0	104.0	95.9	95.4	88.1	42.4	65.5	70.1
IRELAND	217.8	256.7	260.5	218.7	226.2	211.7	148.5	110.6	111.4	116.6	100.0	102.8	97.6	119.3	119.6	114.7	117.2	104.5	50.6	80.8	86.5
ITALY	234.3	289.8	309.8	246.8	251.9	243.0	164.2	116.2	117.1	117.7	100.0	100.7	98.2	127.8	131.9	133.2	125.8	117.1	54.6	87.2	93.9
NETHERLANDS	178.6	233.8	247.1	208.8	222.1	217.5	147.1	104.7	107.2	115.2	100.0	102.9	96.9	106.4	106.4	96.8	103.2	100.3	46.5	73.8	78.9
PORTUGAL	217.7	248.6	273.8	248.1	248.2	234.1	168.8	123.8	121.8	120.9	100.0	94.0	83.3	99.4	102.3	94.0	96.5	92.1	42.9	67.6	72.5
SPAIN	220.9	276.3	300.8	284.7	280.6	263.9	183.1	130.8	124.1	119.6	100.0	99.5	95.6	121.2	127.7	119.4	121.4	118.1	55.1	87.4	93.6
SWEDEN	191.4	227.6	272.1	248.0	242.4	227.2	165.4	120.4	116.0	116.2	100.0	96.6	93.9	128.0	130.1	123.4	119.6	116.3	56.6	92.0	99.7
UNITED KINGDOM	179.6	204.5	228.5	203.8	216.7	205.6	160.7	117.8	109.3	113.6	100.0	97.6	96.6	117.5	118.0	117.1	119.1	94.9	42.7	68.6	75.5
EUROPEAN UNION	189.6	233.0	259.2	222.4	232.1	223.2	155.3	110.6	111.0	115.9	100.0	101.5	96.6	111.5	111.9	104.2	109.8	102.9	47.8	76.4	82.6
CHINA,P.R.:HONG KONG	160.5	195.6	218.0	208.5	214.7	190.2	164.8	131.0	116.4	99.7	100.0	99.5	96.3	89.5	75.4	68.0	65.0	54.3	25.6	40.8	44.0
CHINA,P.R.: MAINLAND	87.5	97.4	102.2	79.0	83.8	100.1	104.7	91.2	117.1	109.5	100.0	103.0	100.8	103.5	150.2	140.8	136.8	110.9	50.4	82.7	91.0
KOREA	202.9	208.6	218.8	182.6	181.5	185.1	167.3	129.1	113.0	99.4	100.0	97.9	101.4	106.1	104.8	101.2	104.3	101.3	64.6	87.5	94.3
OTHER NE ASIA	152.3	167.1	182.1	148.7	157.0	158.1	139.0	113.5	115.1	102.6	100.0	99.8	100.4	102.5	106.5	100.7	101.8	90.0	46.6	70.5	76.4
TOTAL	215.1	224.5	240.1	185.8	182.3	175.6	134.3	102.7	99.8	101.3	100.0	97.0	94.1	95.5	94.3	91.2	99.0	89.6	44.8	69.1	74.8

Source:

Table A.19

Real Effective Exchange Rates of Malaysia, 1980-2000
(1995=100)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
INDONESIA	17.9	16.2	17.3	33.1	41.3	43.1	53.2	91.7	89.3	92.0	100.0	108.4	136.8	141.6	146.1	173.7	186.7	230.4	1402.7	954.9	954.9
MALAYSIA	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
PHILIPPINES	14.7	14.6	16.6	28.4	62.8	69.5	77.2	82.5	80.3	79.7	100.0	123.6	124.2	137.4	125.4	130.5	134.4	135.9	134.4	133.3	134.1
SINGAPORE	215.5	187.2	187.0	184.5	184.5	174.8	158.4	155.6	131.5	115.4	100.0	87.9	91.1	87.7	75.4	71.3	69.9	62.0	40.5	45.4	45.2
THAILAND	98.9	100.2	108.4	109.7	113.7	133.7	116.0	116.5	104.3	100.6	100.0	96.2	111.1	108.1	102.7	110.6	113.4	138.9	124.1	106.0	107.0
ASEAN-5	94.1	93.6	106.1	124.2	133.3	137.4	132.0	136.5	119.9	109.2	100.0	90.5	96.0	93.1	82.0	79.9	80.3	74.6	50.1	55.0	54.8
JAPAN	378.6	319.7	397.0	365.4	358.4	322.1	148.7	115.0	83.6	90.5	100.0	83.7	86.3	65.1	52.9	49.2	65.2	64.6	38.8	34.5	34.3
UNITED STATES	154.4	137.8	134.1	135.8	133.2	118.7	109.8	115.2	106.7	99.7	100.0	96.7	112.7	110.4	106.2	116.7	115.6	92.4	47.5	50.7	50.7
AUSTRIA	199.9	270.4	302.0	338.9	412.5	392.9	198.0	142.5	125.8	135.0	100.0	102.0	105.3	115.6	107.2	91.7	100.2	106.5	56.0	60.3	59.6
BELGIUM-LUXEM	118.2	170.1	250.8	317.9	398.3	374.6	196.2	143.8	129.1	138.6	100.0	101.0	104.4	118.3	106.5	90.8	99.2	105.9	55.7	60.0	59.3
DENMARK	128.0	182.6	243.2	296.5	373.0	347.9	187.7	140.8	126.2	139.1	100.0	103.3	107.3	121.2	112.2	95.6	101.5	105.3	55.7	60.1	61.6
FINLAND	146.9	175.5	213.2	288.2	329.1	311.8	193.0	152.3	127.7	125.6	100.0	108.2	154.7	246.5	198.3	152.1	166.8	170.4	92.3	89.6	89.0
FRANCE	93.0	137.3	195.4	266.0	343.1	323.1	177.6	140.4	127.7	136.9	100.0	103.9	106.6	119.4	110.4	98.0	102.0	106.2	55.4	59.8	59.0
GERMANY	195.4	269.6	302.6	339.1	413.3	394.0	198.3	142.6	126.0	135.0	100.0	102.1	105.3	115.6	107.2	91.8	100.3	106.5	56.0	60.3	59.6
GREECE	11.2	16.8	23.8	41.9	67.4	90.1	85.6	84.1	85.4	104.7	100.0	127.9	163.1	231.0	248.8	249.2	266.5	274.3	165.1	171.0	171.5
IRELAND	100.3	145.0	182.4	239.7	310.0	287.4	167.8	143.1	126.0	136.2	100.0	101.9	106.6	141.1	130.3	124.7	124.1	110.4	63.9	70.2	69.4
ITALY	78.9	124.1	170.9	218.2	286.4	301.4	170.0	134.9	125.9	130.8	100.0	103.7	119.3	190.5	192.4	215.6	191.7	186.8	99.2	107.5	106.2
NETHERLANDS	184.0	258.8	288.5	333.6	413.6	394.8	198.8	142.6	125.7	135.2	100.0	102.0	105.1	114.9	106.1	90.7	99.1	106.2	56.1	60.3	59.6
PORTUGAL	19.0	25.7	41.7	82.0	140.5	169.5	120.9	112.6	108.8	121.6	100.0	99.4	101.1	140.5	144.0	131.1	135.3	139.8	75.6	81.4	80.4
SPAIN	76.4	113.0	155.8	268.8	331.3	330.2	207.2	169.1	139.3	134.5	100.0	100.5	113.7	172.1	183.5	174.5	178.5	190.7	101.4	109.7	108.4
SWEDEN	78.8	100.9	151.1	227.8	260.2	250.8	159.0	132.2	114.3	118.3	100.0	101.0	109.2	191.0	180.5	169.4	148.4	153.8	85.7	94.2	93.4
UNITED KINGDOM	90.9	106.7	139.4	187.9	237.6	224.9	162.5	136.7	107.1	118.1	100.0	98.4	115.2	155.9	144.3	149.1	150.9	109.8	55.2	62.2	65.4
EUROPEAN UNION	112.2	148.4	189.8	256.0	319.4	310.2	178.8	139.7	119.8	128.9	100.0	101.2	109.7	133.1	123.6	112.7	117.8	114.2	59.9	65.3	65.5
CHINA,P.R.:HONG KONG	63.0	70.6	81.0	116.8	134.2	118.7	110.2	115.5	107.1	100.0	100.0	96.3	111.3	108.9	104.6	115.0	113.9	91.3	47.0	50.0	50.0
CHINA,P.R.: MAINLAND	15.2	17.5	21.0	23.2	31.3	44.7	57.2	69.8	110.7	106.6	100.0	119.8	149.9	160.2	344.9	355.6	348.0	277.7	142.4	151.8	151.8
KOREA	113.7	127.6	143.1	163.1	172.7	179.3	170.3	155.7	113.9	89.7	100.0	103.9	137.2	142.0	136.9	138.5	149.3	167.0	184.8	145.7	145.7
OTHER NE ASIA	32.1	43.5	52.6	63.8	83.6	104.1	106.3	111.5	110.8	96.7	100.0	104.6	129.2	132.2	147.6	149.4	150.7	138.4	93.2	92.0	92.0
WORLD	116.0	124.1	139.8	158.7	174.6	174.2	133.8	123.7	105.3	103.6	100.0	92.7	101.2	94.2	84.6	81.9	91.4	85.4	51.7	53.3	53.2

Source:

Table A.20

Real Effective Exchange Rates of Philippines, 1980-2000
(1995=100)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
INDONESIA	67.9	65.6	63.9	66.4	67.9	77.6	77.8	93.9	94.4	101.5	100.0	101.6	115.4	109.5	116.9	123.5	126.7	138.0	232.1	162.7	156.4
MALAYSIA	96.6	100.3	97.9	79.4	77.1	88.0	83.9	83.6	91.9	100.9	100.0	104.0	108.0	106.7	117.4	120.3	124.1	126.3	131.4	138.2	139.1
PHILIPPINES	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SINGAPORE	129.2	126.6	126.0	103.9	102.2	116.0	107.1	106.0	105.8	109.1	100.0	96.8	104.7	102.8	105.5	106.8	111.5	107.6	95.4	110.3	115.0
THAILAND	108.0	109.8	112.8	91.2	93.1	115.4	100.9	99.1	99.5	104.3	100.0	99.1	111.2	108.5	114.8	119.4	122.0	133.7	128.0	125.7	128.4
ASEAN-5	91.1	86.9	94.9	85.2	83.2	95.1	90.7	95.2	99.0	105.1	100.0	99.9	107.7	105.2	109.6	114.2	116.9	117.1	113.7	122.3	125.4
JAPAN	167.9	167.4	187.6	148.5	145.3	158.0	102.0	90.0	84.0	96.2	100.0	94.6	102.6	90.1	92.0	94.1	115.6	118.1	99.7	102.6	108.3
UNITED STATES	138.9	135.3	132.6	106.5	102.1	109.0	98.3	97.6	99.4	103.3	100.0	100.8	114.7	112.8	123.1	132.9	137.3	125.4	96.9	106.9	110.3
AUSTRIA	138.4	171.5	177.6	153.0	161.4	178.6	119.2	100.1	101.7	117.7	100.0	104.4	110.8	114.5	122.3	117.2	128.5	136.7	107.6	120.4	124.9
BELGIUM-LUXEM	119.5	151.6	174.9	153.7	163.4	176.9	120.8	102.3	105.6	119.5	100.0	104.0	112.1	118.8	125.7	121.2	132.6	140.9	110.8	123.9	128.4
DENMARK	141.5	172.1	186.4	161.8	172.5	186.1	126.1	105.5	105.2	118.8	100.0	106.0	114.9	123.4	132.9	127.3	137.2	142.9	111.9	124.4	130.3
FINLAND	163.3	181.4	189.0	170.4	171.9	185.1	135.3	115.9	111.3	116.7	100.0	106.6	134.7	170.1	172.3	158.4	176.1	183.8	145.9	154.4	159.4
FRANCE	125.1	152.7	168.1	150.6	160.5	172.3	119.1	102.9	105.3	118.7	100.0	105.4	113.4	120.2	129.8	127.3	136.0	143.3	112.6	126.7	131.6
GERMANY	127.3	160.1	166.5	143.4	156.2	174.9	118.8	100.9	103.2	117.1	100.0	104.3	109.5	112.4	120.2	115.7	127.3	134.8	106.1	119.3	124.0
GREECE	83.7	108.8	123.0	127.3	153.3	173.9	131.7	112.6	110.2	120.9	100.0	101.1	107.0	113.8	121.6	118.4	120.9	121.5	98.5	106.6	109.6
IRELAND	147.9	168.3	166.5	145.3	153.6	164.2	115.5	103.9	105.2	118.3	100.0	104.5	112.6	130.6	139.9	141.6	148.5	144.2	117.4	131.5	135.4
ITALY	159.1	190.0	198.0	164.0	171.1	188.4	127.8	109.1	110.6	119.5	100.0	102.3	113.3	139.9	154.3	164.4	159.4	161.6	126.7	141.9	146.8
NETHERLANDS	121.3	153.3	157.9	138.7	150.9	168.7	114.4	98.3	101.2	117.0	100.0	104.6	111.8	116.5	124.5	119.5	130.7	138.3	108.0	120.1	123.4
PORTUGAL	147.9	163.0	175.0	164.9	168.6	181.6	131.3	116.2	115.0	122.7	100.0	95.5	96.2	108.9	119.6	116.1	122.3	127.1	99.5	110.1	113.3
SPAIN	150.0	181.2	192.2	189.1	190.6	204.7	142.5	122.8	117.2	121.4	100.0	101.1	110.3	132.7	149.3	147.5	153.8	162.9	127.8	142.2	146.4
SWEDEN	130.0	149.2	173.9	164.8	164.6	176.2	128.7	113.1	109.5	117.9	100.0	98.1	108.4	140.1	152.2	152.4	151.6	160.4	131.4	149.8	156.0
UNITED KINGDOM	122.0	134.1	146.0	135.4	147.2	159.5	125.0	110.6	103.2	115.3	100.0	99.2	111.4	128.7	138.0	144.6	151.0	130.9	99.0	111.6	118.1
EUROPEAN UNION	126.9	154.0	164.0	144.9	155.9	171.1	120.5	104.1	104.3	117.4	100.0	103.1	111.3	121.3	129.7	128.7	137.0	139.6	109.2	122.5	127.5
CHINA,P.R.:HONG KONG	109.0	128.3	139.3	138.5	145.8	147.5	128.2	123.0	110.0	101.2	100.0	101.2	111.1	98.0	88.2	84.0	82.3	74.9	59.3	66.4	68.8
CHINA,P.R.: MAINLAND	59.4	63.8	65.3	52.5	57.0	77.6	81.5	85.7	110.6	111.2	100.0	104.7	116.3	113.3	175.6	173.9	173.4	153.1	117.0	134.6	142.3
KOREA	137.8	136.8	139.8	121.3	123.3	143.5	130.1	121.2	106.7	100.9	100.0	99.5	117.0	116.2	122.5	125.0	132.1	139.8	149.9	142.4	147.6
OTHER NE ASIA	94.9	102.0	103.2	110.6	98.1	111.4	113.9	110.3	109.0	102.7	100.0	101.1	113.9	106.2	106.7	107.0	109.0	104.9	95.0	101.7	105.7
WORLD	131.9	134.1	139.7	117.8	111.1	120.2	103.5	98.1	97.1	103.7	100.0	99.5	110.0	105.7	110.5	114.3	124.1	121.1	101.4	109.5	113.7

Source:

Table A.21 Real Effective Exchange Rates of Singapore, 1980-2000 (1995=100)																					
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
INDONESIA	52.6	51.8	50.7	63.9	66.4	66.8	72.7	88.6	89.3	93.0	100.0	105.0	110.3	106.5	110.8	115.6	113.7	128.3	243.1	147.6	136.0
MALAYSIA	74.8	79.2	77.7	76.4	75.5	75.9	78.3	78.9	86.8	92.5	100.0	107.5	103.2	103.8	111.2	112.6	111.3	117.4	137.7	125.3	121.0
PHILIPPINES	77.4	79.0	79.4	96.2	97.8	86.2	93.4	94.4	94.5	91.7	100.0	103.3	95.5	97.3	94.8	93.6	89.7	93.0	104.8	90.7	87.0
SINGAPORE	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
THAILAND	83.6	86.7	89.6	87.7	91.1	99.5	94.2	93.5	94.0	95.7	100.0	102.4	106.2	105.6	108.8	111.8	109.5	124.3	134.1	114.0	111.7
ASEAN-5	76.2	80.3	79.3	78.8	78.4	79.4	81.4	82.1	88.6	93.1	100.0	106.2	103.6	103.8	109.8	111.2	109.3	116.3	132.9	118.5	114.7
JAPAN	129.9	132.2	148.9	142.9	142.1	136.2	95.3	84.9	79.4	88.2	100.0	97.8	98.0	87.6	87.2	88.1	103.7	109.8	104.5	93.1	94.2
UNITED STATES	107.5	106.9	105.3	102.5	99.9	93.9	91.8	92.1	94.0	94.7	100.0	104.1	109.6	109.7	116.6	124.4	123.2	116.6	101.6	96.9	95.9
AUSTRIA	107.1	135.4	141.0	147.2	157.8	154.0	111.3	94.4	96.2	107.9	100.0	107.8	105.8	111.4	115.9	109.7	115.3	127.1	112.7	109.2	108.6
BELGIUM-LUXEM	92.5	119.7	138.8	147.9	159.8	152.5	112.8	96.5	99.8	109.6	100.0	107.4	107.1	115.6	119.1	113.4	119.0	131.0	116.1	112.4	111.7
DENMARK	109.5	135.9	148.0	155.7	168.7	160.4	117.8	99.5	99.5	108.9	100.0	109.5	109.8	120.1	125.9	119.2	123.1	132.9	117.3	112.8	113.3
FINLAND	126.4	143.3	150.1	164.0	168.1	159.5	126.4	109.4	105.2	106.9	100.0	110.2	128.7	165.5	163.3	148.2	158.0	170.9	152.9	140.0	138.6
FRANCE	96.9	120.6	133.5	145.0	157.0	148.5	111.2	97.1	99.6	108.8	100.0	108.9	108.3	116.9	123.0	119.1	122.0	133.2	118.0	114.9	114.5
GERMANY	98.5	126.4	132.2	138.0	152.8	150.7	110.9	95.2	97.6	107.3	100.0	107.7	104.7	109.3	113.9	108.3	114.2	125.3	111.2	108.2	107.8
GREECE	64.8	85.9	97.6	122.5	149.9	149.9	123.0	106.3	104.2	110.8	100.0	104.4	102.2	110.8	115.3	110.8	108.5	113.0	103.2	96.6	95.4
IRELAND	114.5	132.9	132.2	139.8	150.2	141.5	107.9	98.0	99.4	108.5	100.0	108.0	107.6	127.1	132.6	132.5	133.2	134.1	123.0	119.2	117.7
ITALY	123.1	150.1	157.1	157.8	167.4	162.4	119.3	102.9	104.5	109.5	100.0	105.7	108.2	136.1	146.2	153.9	142.9	150.2	132.8	128.7	127.7
NETHERLANDS	93.9	121.1	125.4	133.5	147.6	145.4	106.9	92.8	95.7	107.2	100.0	108.1	106.8	113.4	117.9	111.9	117.2	128.6	113.1	108.9	107.3
PORTUGAL	114.4	128.7	138.9	158.7	164.9	156.5	122.7	109.7	108.7	112.5	100.0	98.7	91.9	105.9	113.3	108.7	109.7	118.1	104.3	99.8	98.6
SPAIN	116.1	143.1	152.6	182.0	186.4	176.4	133.1	115.9	110.8	111.3	100.0	104.4	105.4	129.1	141.5	138.0	138.0	151.5	133.9	129.0	127.3
SWEDEN	100.6	117.9	138.0	158.6	161.0	151.9	120.2	106.7	103.5	108.1	100.0	101.4	103.6	136.3	144.2	142.6	136.0	149.2	137.6	135.8	135.7
UNITED KINGDOM	94.4	105.9	115.9	130.3	144.0	137.4	116.8	104.4	97.6	105.7	100.0	102.5	106.5	125.2	130.8	135.4	135.4	121.7	103.7	101.2	102.7
EUROPEAN UNION	97.8	119.6	129.5	140.9	153.8	148.3	113.9	99.3	99.2	107.7	100.0	106.3	106.6	118.7	124.2	121.5	124.6	130.2	114.7	111.3	111.1
CHINA,P.R.:HONG KONG	84.3	101.3	110.6	133.3	142.6	127.2	119.8	116.0	104.0	92.7	100.0	104.5	106.1	95.3	83.5	78.6	73.9	69.7	62.2	60.2	59.8
CHINA,P.R.: MAINLAND	46.0	50.4	51.9	50.5	55.7	66.9	76.1	80.8	104.5	101.9	100.0	108.2	111.1	110.3	166.4	162.8	155.5	142.3	122.6	122.1	123.7
KOREA	106.6	108.0	111.0	116.8	120.6	123.7	121.5	114.4	100.9	92.5	100.0	102.8	111.8	113.0	116.1	117.0	118.5	130.0	157.0	129.1	128.3
OTHER NE ASIA	70.9	82.0	84.6	91.5	89.6	87.7	97.5	100.5	103.4	95.3	100.0	104.9	108.7	102.9	102.4	100.0	97.5	93.7	89.7	85.5	85.4
WORLD	92.7	100.4	102.4	102.4	102.3	99.8	93.3	90.0	91.2	95.1	100.0	103.8	105.0	103.5	107.0	108.1	111.3	112.9	109.4	101.9	100.9

Source:

Table A.22

Real Effective Exchange Rates for Thailand, 1980-2000

(1990 = 100)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
INDONESIA	62.9	59.7	56.6	72.9	72.9	67.2	77.1	94.8	94.9	97.3	100.0	102.5	103.8	100.9	101.8	103.4	103.8	103.2	181.3	129.4	121.8
MALAYSIA	89.5	91.4	86.8	87.0	82.8	76.3	83.1	84.4	92.3	96.7	100.0	105.0	97.1	98.3	102.2	100.7	101.7	94.5	102.7	109.9	108.3
PHILIPPINES	92.6	91.1	88.6	109.7	107.4	86.6	99.1	100.9	100.5	95.8	100.0	100.9	89.9	92.1	87.1	83.7	81.9	74.8	78.1	79.5	77.9
SINGAPORE	119.7	115.4	111.6	114.0	109.8	100.5	106.1	107.0	106.3	104.5	100.0	97.7	94.1	94.7	91.9	89.5	91.3	80.5	74.6	87.7	89.5
THAILAND	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
ASEAN-5	97.7	100.0	92.2	98.5	96.4	87.4	95.5	98.8	101.9	101.6	100.0	99.7	95.3	95.8	94.9	92.6	94.5	86.1	88.8	96.8	96.8
JAPAN	155.5	152.5	166.2	162.9	156.0	136.9	101.1	90.8	84.4	92.2	100.0	95.5	92.3	83.0	80.1	78.8	94.7	88.4	77.9	81.6	84.3
UNITED STATES	128.7	123.3	117.5	116.9	109.7	94.4	97.4	98.5	99.9	99.0	100.0	101.7	103.2	103.9	107.2	111.3	112.5	93.8	75.7	85.0	85.9
AUSTRIA	128.2	156.2	157.4	167.8	173.3	154.8	118.1	101.0	102.3	112.8	100.0	105.3	99.6	105.5	106.5	98.1	105.3	102.2	84.0	95.8	97.2
BELGIUM-LUXEM	110.7	138.1	155.0	168.6	175.5	153.3	119.7	103.2	106.2	114.6	100.0	104.9	100.8	109.5	109.4	101.5	108.7	105.4	86.6	98.6	100.0
DENMARK	131.0	156.8	165.2	177.5	185.2	161.3	125.0	106.4	105.8	113.8	100.0	107.0	103.4	113.7	115.7	106.6	112.5	106.9	87.4	98.9	101.5
FINLAND	151.3	165.3	167.5	186.9	184.6	160.4	134.1	117.0	111.9	111.8	100.0	107.6	121.2	156.7	150.0	132.6	144.3	137.5	114.0	122.8	124.1
FRANCE	115.9	139.1	149.0	165.2	172.3	149.2	118.0	103.9	105.9	113.8	100.0	106.4	101.9	110.7	113.0	106.6	111.4	107.2	88.0	100.8	102.5
GERMANY	117.9	145.9	147.5	157.3	167.7	151.5	117.7	101.8	103.8	112.2	100.0	105.2	98.5	103.5	104.7	96.9	104.3	100.8	82.9	94.9	96.6
GREECE	77.5	99.1	109.0	139.6	164.5	150.6	130.5	113.7	110.8	115.9	100.0	102.0	96.2	104.9	105.9	99.2	99.1	90.9	76.9	84.8	85.4
IRELAND	137.0	153.4	147.5	159.4	164.9	142.2	114.5	104.8	105.7	113.4	100.0	105.4	101.3	120.3	121.8	118.5	121.7	107.9	91.7	104.5	105.4
ITALY	147.4	173.1	175.4	179.9	183.7	163.2	126.6	110.1	111.2	114.5	100.0	103.3	101.9	128.9	134.3	137.7	130.6	120.9	99.0	112.9	114.4
NETHERLANDS	112.4	139.7	140.0	152.2	162.0	146.1	113.4	99.2	101.7	112.1	100.0	105.5	100.6	107.3	108.4	100.1	107.1	103.5	84.3	95.5	96.1
PORTUGAL	137.0	148.5	155.0	180.8	181.0	157.3	130.1	117.3	115.6	117.6	100.0	96.4	86.5	100.3	104.1	97.2	100.2	95.1	77.8	87.5	88.3
SPAIN	139.0	165.1	170.3	207.5	204.6	177.4	141.2	123.9	117.8	116.4	100.0	102.0	99.2	122.3	130.0	123.5	126.0	121.9	99.8	113.1	114.0
SWEDEN	120.4	136.0	154.1	180.7	176.8	152.7	127.5	114.1	110.1	113.0	100.0	99.0	97.5	129.1	132.5	127.6	124.2	120.0	102.6	119.1	121.5
UNITED KINGDOM	113.0	122.2	129.4	148.5	158.1	138.1	123.9	111.7	103.7	110.5	100.0	100.1	100.2	118.6	120.2	121.1	123.7	98.0	77.4	88.8	91.9
EUROPEAN UNION	117.5	141.0	145.1	159.8	168.2	149.7	119.7	105.0	105.1	112.7	100.0	104.0	100.2	112.4	113.6	108.0	113.8	105.4	85.9	98.0	99.8
CHINA,P.R.:HONG KONG	100.9	116.9	123.4	151.9	156.6	127.8	127.1	124.1	110.6	96.9	100.0	102.1	99.9	90.3	76.8	70.3	67.5	56.1	46.4	52.8	53.6
CHINA,P.R.: MAINLAND	55.0	58.2	57.9	57.6	61.2	67.2	80.7	86.5	111.2	106.6	100.0	105.7	104.6	104.4	152.9	145.6	142.1	114.5	91.4	107.1	110.8
KOREA	127.6	124.6	123.9	133.1	132.4	124.4	129.0	122.3	107.2	96.7	100.0	100.4	105.2	107.1	106.7	104.7	108.3	104.6	117.1	113.3	114.9
OTHER NE ASIA	75.8	83.3	82.0	96.4	95.1	92.9	105.7	103.9	109.9	100.2	100.0	102.4	103.2	99.1	100.4	97.9	95.4	81.2	70.3	78.3	79.9
WORLD	115.9	123.0	120.7	129.3	124.9	111.7	103.7	98.4	97.2	99.9	100.0	100.0	97.8	96.2	95.3	93.6	101.2	90.9	79.9	87.9	89.3

Source:

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